

UltraNav II

INSTALLATION AND OPERATION INSTRUCTIONS



LITHO IN U.S.A.

988-0135-02

WARNING!

USE THIS GPS RECEIVER ONLY AS AN AID TO NAVIGATION. A CAREFUL NAVIGATOR NEVER RELIES ON ONLY ONE METHOD TO OBTAIN POSITION INFORMATION.

CAUTION

This GPS receiver, (like all GPS navigation equipment) will show the shortest, most direct path to a waypoint. It provides navigation data to the waypoint regardless of obstructions. Therefore, the prudent navigator will not only take advantage of all available navigation tools when travelling to a waypoint, but will also visually check to make certain a clear, safe path to the waypoint is always available.

NOTICE!

As of this writing, the Department of Defense (DOD) has not declared the GPS navigation system operational. The system is still in a testing phase. Satellites can be turned off or accuracy can be degraded at will by the system operators. Remember that the UltraNav II, or any GPS receiver is only as accurate as the system it's using.

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All features and specifications subject to change without notice.
All screens in this manual are simulated.

SONAR SPECIFICATIONS

UltraNav II Dimensions 5.875"H x 7.75"W x 3.875"D
Input Voltage 10-15 vDC
Current 500 ma (lights off)
650 ma (lights on)

Transmitter
Frequency 192 kHz
Output Power 600 watts (peak-to-peak)
(typical) 75 watts (RMS)
Display Size 2.8"H x 3.5"W
Pixels 128 H x 160 W
20,480 Total

UltraNav II GPS RECEIVER SPECIFICATIONS

GPS Module Dimensions 2.5"H x 4.1"W x 7" D
Channels Five Parallel
Four continuous for position
All satellites in view tracked
Update rate One second
Accuracy Maximum accuracy achievable with
Standard Positioning Service
Position 25 meters CEP
Velocity 0.25 meters/sec RMS
Without SA PDOP < 6.0

NMEA 0183 SENTENCES

RMB Minimum Recommended Sentence, Part B
RMC Minimum Recommended Sentence, Part C
GLL Present Position - Latitude/Longitude
APB Autopilot Steering Data
DBT Water Depth
MTW Water Temperature (°C)
VHW Speed Through Water (KPH)
VLW Distance Travelled/LOG (NM)

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GPS MODULE SELF-TEST

This feature tests the GPS module and returns a special code. This code is of interest only to the service department. However, the UltraNav II interprets this code and displays a status message. This message is either "GPS MODULE PASSED" or "GPS MODULE FAILED" and shows at the bottom of the screen. The current software version number also appears near the bottom of the screen. Contact the factory customer service department if the module fails the self test. Do not attempt to use this product if it fails the self test.

GPS SELF TEST	
BIT SUMMARY	0000
LOW ORDER RAM	FFFF
HIGH ORDER RAM	FFFF
PRE PROCESS TEST	0000
PRE PROCESS RAM	FFFF
MULTI INTERFACE	0000
VCO TEST	0000
SIGNAL INJ.	0000
SOFTWARE VERSION	3.20
CLEAR	MODULE HAS PASSED

To use the self test feature, press the MENU key twice while it's in the GPS mode, then press the key next to the "GPS MODULE SELF TEST" label. The screen shown below appears.

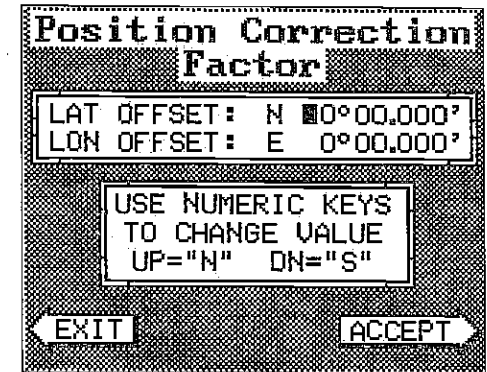
To exit from this screen, press the CLEAR key.

GPS SIMULATOR

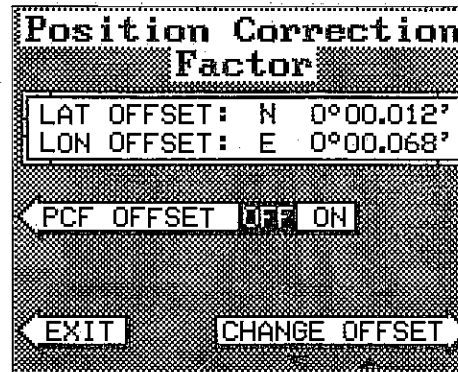
This feature places position and navigation data on all screens, including the plotter. The unit "navigates" a closed course. It shows bearing and distance to go, course over ground, and other information. A recurring message appears, alerting you that the simulator mode is enabled. Don't navigate when the simulator is on!

To turn the simulator on, press the MENU key twice, then press the key next to the "GPS SIMULATOR OFF ON" label. The simulator mode starts immediately. To turn the simulator off, either press and hold the OFF key or repeat the above steps. Press the key next to the "GPS SIMULATOR OFF ON" label.

To set the PCF factor, first press the MENU key, then press the key next to the "CHANGE GPS SETTINGS" label. Now press the key next to the "ADJUST PCF OFFSET" label. The screen shown on the previous page appears.



Now press the key adjacent to the "CHANGE OFFSET" label to enter the correction factor for your location. The screen shown above appears. Remember, this is the difference between the location shown on the present position display and the position shown on the chart.



Use the right and left arrow keys to move the black box to the number that you wish to change in the latitude, then enter the numbers.

Use the up or down arrow keys to change the latitude from north to south, if necessary. Press the key next to the "ACCEPT" label when you've entered the desired latitude offset. Repeat this procedure to change the

longitude. In this example, we have entered .012 degrees north latitude and .068 degrees east longitude as the PCF offset. That is the difference between the present position shown on the unit and our position shown by the chart. In other words, our position shown on the unit is 0.012 degrees north and 0.068 degrees east of the position shown on the chart.

After you've entered the desired offset, press the key next to the "PCF OFFSET OFF ON" label. This turns the PCF correction factor that you entered on. To leave this screen, press the key next to the "EXIT" label. This returns the unit to the last used GPS screen. It also puts your changes into effect.

To turn these changes off, return to this screen and press the key next to the "PCF OFFSET OFF ON" label. Remember, Presetting the unit also erases any PCF offset, thereby turning it off.

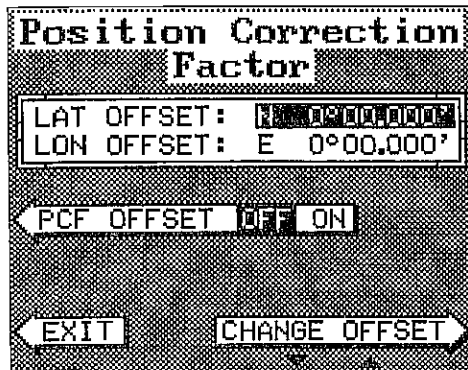
PCF OFFSET

The GPS navigation system relies on complex mathematical calculations to determine your position based on satellite data and other factors. One factor is the Earth's shape. Since the Earth is not a true sphere, variations in the calculations have to be made to accommodate deviations. To make matters more complex, not everyone uses the same data to determine what the deviations are. The size and shape of the ellipsoids that are used to approximate the earth's surface are improved often. This can lead to errors if your navigation device uses one ellipsoid, while your chart uses a different one. The term used for these ellipsoids is "Datum."

To reduce the error factor between datum, this unit gives you the capability to move or "offset" the position shown on the display to match the one on the chart. The unit will add this offset to all position displays at all times.

Remember, the GPS error is very dynamic and the PCF offset should never be used in an attempt to cancel the error. In general terms this feature should only be used if your map indicates what the possible error is. This feature should always be reset to zero (0) when finished with that chart.

For example, suppose you are stopped at a location that is accurately marked on a chart. Your unit shows a longitude position that is .010 degrees less than the one on the chart. Using the Position Correction Factor (PCF) Offset feature, you make the unit read the same as the chart.



If you move, the unit will continuously add the change to all position displays. This makes it more closely match the datum used by the chart. For this reason, you should be careful when entering the PCF offset. This offset is saved in memory. It doesn't change when the unit is turned off. However, a Preset does erase the PCF factor.

INTRODUCTION

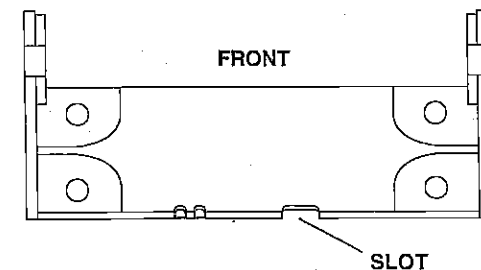
The UltraNav II is a high quality, wide screen combination sonar and differential ready GPS receiver with performance that is second to none in its class. Using menu features and "soft-key" operation, the UltraNav II is also one of the easiest-to-use products that Eagle has ever built. The wide "Ultravision™" screen shows the underwater world with high resolution and detail. The display and keyboard are also lighted for night operation. Installing an optional ST-T speed/temperature sensor, gives digital boat speed, surface water temperature, and distance travelled (log) displays.

Read this manual and take it with you the first few times you use your unit. It makes a great reference if you need it.

MOUNTING

Install the UltraNav II in any convenient location, provided there is clearance behind the unit when it is tilted for the best viewing angle. Holes in the bracket base allow wood screw or through-bolt mounting. You may need to place a piece of plywood on the back of thin fiberglass panels to secure the mounting hardware. Make certain there is enough room behind the unit to attach the power and transducer cables.

The smallest hole that will pass one power or transducer plug is one inch. After the hole is drilled, pass the transducer connector up through the hole first, then pass the power cable down through it.



After the cables have been routed, fill the hole with a good marine sealing compound. Offset the bracket to cover the hole. Route the power cable through the slot and break out one of the other slots in the bracket for the transducer cable.

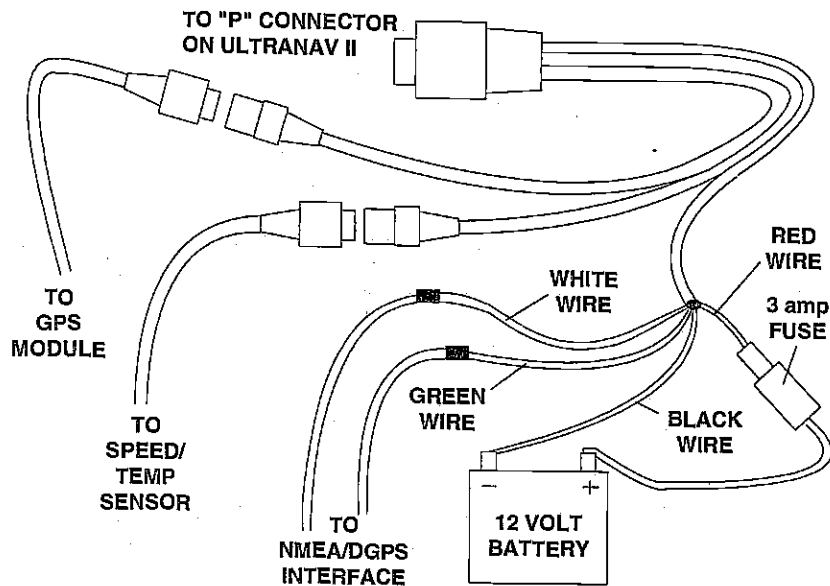
POWER CONNECTIONS

The UltraNav II works from a twelve-volt battery system. For the best results, attach the power cable directly to the battery. You can attach the power cable to an accessory or power buss, however you may have problems with electrical interference. Therefore, it's safer to go ahead and attach the power cable directly to the battery. If the cable is too short, splice #18 gauge wire onto it. The power cable has four wires; red, black, green, and white. Red is the positive lead, black is negative or ground. Make certain to attach the in-line fuse holder to the red lead as close to the power source as possible. For example, if you have to extend the power cable to the battery or power buss, attach one end of the fuse holder directly to the battery or power buss. This will protect both the unit and the power cable in the event of a short. The UltraNav II uses a 3-amp fuse. There is reverse polarity protection built into the UltraNav II. If the power wires are connected backwards, no damage will occur to the unit.

IMPORTANT!

Do not use this product without a 3-amp fuse wired into the power cable! Failure to use a 3-amp fuse will void your warranty.

If you're installing an optional speed/temperature sensor, read the speed/temperature sensor's installation manual for mounting instructions. Route the sensor's cable to the UltraNav II's power cable and plug it into the connector marked "SPEED/TEMP CABLE"



The plotter display automatically shows a .1 mile display in the Man Overboard mode. Your position when the Man Overboard key was pressed is shown by the "S" with a circle and by the waypoint icon with a "0." Steer to the waypoint flag to get back to the position saved when the Man Overboard key was pressed.

IMPORTANT!

The UltraNav II doesn't save the Man Overboard position in the waypoint table. However, it does save the position on the Man Overboard screen.

The UltraNav II always shows navigation data to the position shown on the Man Overboard screen whenever the Man Overboard key is pressed. To stop the unit from navigating to the Man Overboard position, press the key next to the "DISABLE MOB" label. This resets the Man Overboard navigation.

For example, suppose you are viewing the Position screen, and you press the Man Overboard key, then press the GPS key. The UltraNav II first displays then stores your present position on the Man Overboard screen, then switches back to the Position screen. If you press the Man Overboard key again, it will still show navigation data to the position you were in when you first pressed the Man Overboard key - not your present position. Repeated pressing of the Man Overboard key does not repeatedly save your present position! The unit only saves the position the first time the Man Overboard key is pressed. To save a new Man Overboard position, you must first clear the old position by pressing the key adjacent to the "DISABLE MOB" label.

You can navigate to a waypoint using the Waypoint Recall feature, however when you go back to the Man Overboard screen, the UltraNav II stops navigating to the recalled waypoint.

Remember, saving the victim is the primary goal. Try all options to rescue the person immediately after the accident happens. Training and education are also good accident preventatives. The Coast Guard has excellent safety courses. Instruct all members on board your boat on safety procedures before leaving the dock. Make certain all on board know what to do before any emergency occurs.

For more information on saving and recalling waypoints, see "How to Save a Waypoint" section in this manual.

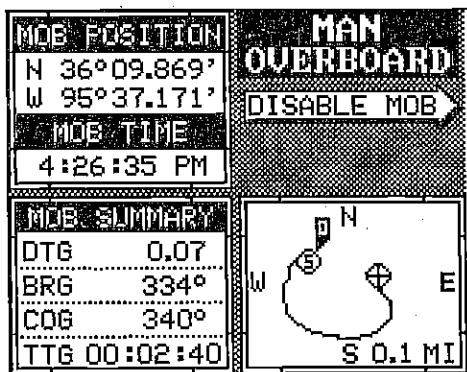
PRESET

The Preset feature returns all sonar and GPS units to their original factory settings. This resets the units of measure, speaker volume, automatic mode on the sonar side, display contrast, and more. This doesn't erase any waypoints or routes, however.

To preset the unit, press the MENU key until the "PRESET UNIT" label appears. Press the key next to that label. The menu screen disappears and the UltraNav II returns to the GPS position screen. All units will be returned to their factory settings.

MAN OVERBOARD

One of boating's most terrifying events is having a friend or family member fall overboard. This situation can be deadly on any body of water, fresh or salt. It's particularly dangerous at night or if you're out of sight of land. Of course, the first thing to do is remain calm and try all standard safety measures to try and rescue the person. If you lose sight of the person, you can use the UltraNav II to help start a search pattern.



Once you're back at the helm after initial rescue efforts have failed, press the UltraNav II's MAN OVERBOARD key. The screen shown at right appears.

Your position at the time you pressed the Man Overboard key is shown in the top left corner of the display. Beneath the position is the time that you pressed the Man Overboard key. At the bottom of the screen are the navigation data displays showing the Distance (DTG), Bearing (BRG), Course (COG), and Time To Go (TTG) back to the position at the top of the display. Using these displays along with the plotter in the lower right corner of the display gives you the information you need to steer back to the man overboard position.

The white wire is for a NMEA interface. The UltraNav II sends data to another electronic navigation devices through the white wire. The green wire is for a differential GPS (DGPS) receiver input. If the white and green wires are not used, tape their ends so that they cannot short.

To connect a device to the UltraNav's NMEA output (white wire); attach a two-wire shielded cable from the other device's NMEA input to the white and black wires on the UltraNav II's power cable. Solder the shield to the black wire on the power cable. Do not connect the shield to the other device. See the other instrument's manual for more wiring instructions. Use the same procedure to connect the DGPS receiver's output to the green and black wires on the UltraNav II.

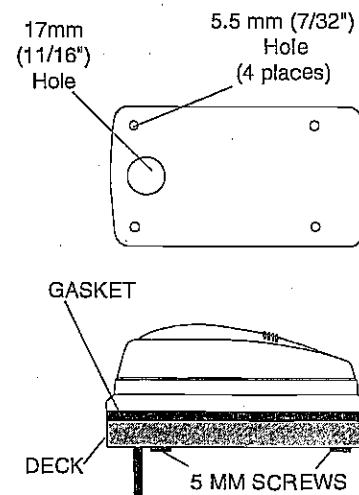
Note: The shielded wire is not absolutely necessary, however it is best to use it due to the high electrical noise levels found in today's marine environments. To avoid problems later, we highly suggest that you use shielded wires whenever making a communications connection between two instruments. See the NMEA section in the GPS section in this manual for more information.

GPS MODULE INSTALLATION

The GPS module can be installed on a flat surface or (with the supplied adapter) on a pole. Mount the module in an area that guarantees a clear view of the sky at all times. In order for the module to receive the signals from the satellites, it must not be obstructed. An ideal location is on a cabin roof, or deck. The gunnels also make a good location. Attaching the pole mounting adapter lets you install the module on a one inch mast. However, for lightning protection, the antenna shouldn't be the highest part of the boat.

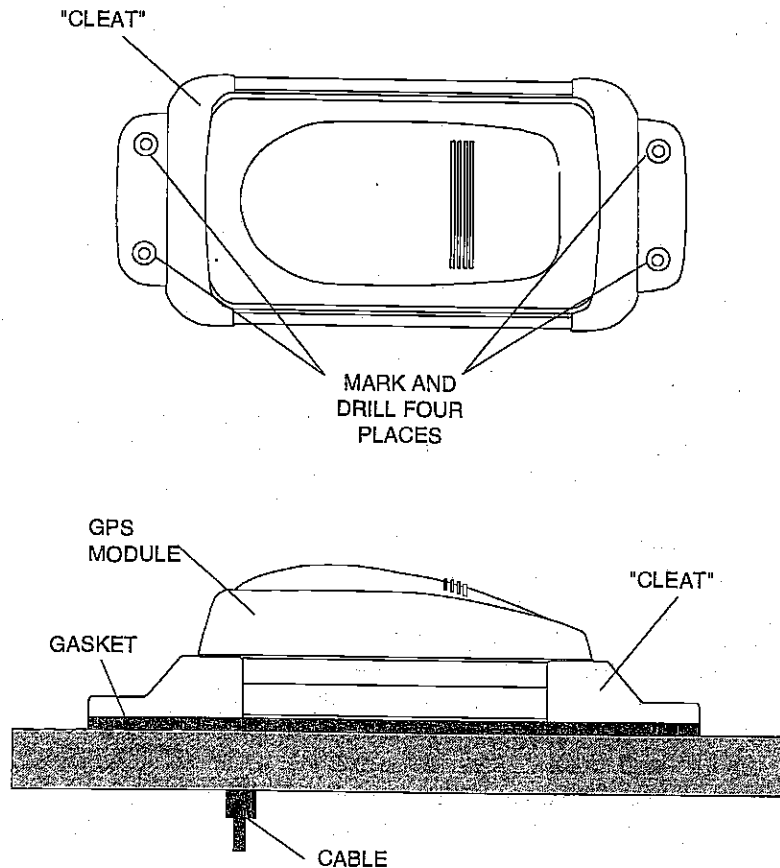
Surface Mounting - With Access

If you have access underneath the mounting surface, use the gasket supplied with the GPS module as a template. Drill four 5.5 mm (7/32") holes and one 17 mm (11/16") hole for the module's cable. Attach the cable to the module and pass it down through the hole in the gasket and the mounting surface. Use 5 mm screws, flat washers, and lock washers to fasten the GPS module to the mounting surface. Route the cable to the UltraNav II.



Surface Mounting - Without Access

If you don't have access to the back side of the mounting surface, use the "cleats" supplied with the UltraNav II. (Note: This is assuming you can "snake" the module's cable to a location that is accessible. A hole will still need to be drilled in the mounting surface for the cable.) Using the gasket as a template, mark and drill the 17 mm (11/16") hole for the cable. Attach the cable to the module and drop the other end of the cable through the gasket and down the hole. Place the module on the gasket. Slide the "cleats" onto each end of the module and (using the cleats as templates) mark four holes for 5 mm (#10) mounting screws. Drill the holes, then replace the cleats on the module and fasten them to the mounting surface with 5 mm (#10) screws. Route the cable to the UltraNav II.



strength (the higher the number, the better), and the signal-to-noise ratio (SNR). The higher the SNR number, the better, also.

The lower half of the screen shows statistics for each of the receiver's five channels. This includes the satellite number (PRN), its status (STAT), the User Differential Range Error (UDRE), Time status (TIME), and if SA (Selective Availability) is on or off. The UDRE is the range error from your position to the satellite. If there is an "OK" in this field, then the range error to that satellite is 8 meters or less 68 percent of the time.

DDFS: ON					
STAT ID: 1	FREQ: 296.0				
HEALTH: 0	BIT: 100				
SIGNAL: 053	SNR: 31				
PRN	STAT	UDRE	TIME	SA	
1	15	OK	OK	OK	OFF
2	13	OK	OK	OK	OFF
3	02	OK	OK	OK	ON
4	27	OK	OK	OK	ON
5	26	BAD	OK	BAD	ON
CLEAR					

For more information, read your beacon receiver's manual.

SELECT UNITS OF MEASURE

(See the Select Units of Measure in the Plotter section of this manual.)

TRUE and MAGNETIC POSITION

True and magnetic north are not always the same. True north is the top of the world. It's where all lines of longitude converge. Magnetic north is the location our compasses point. It lies several hundred miles to the south of true north, at a location in Canada.

Charts are usually laid out according to a Mercator projection that uses true north. If you plot a course on a chart using the Mercator projection, you'll either have to convert magnetic readings to true or use true readings.

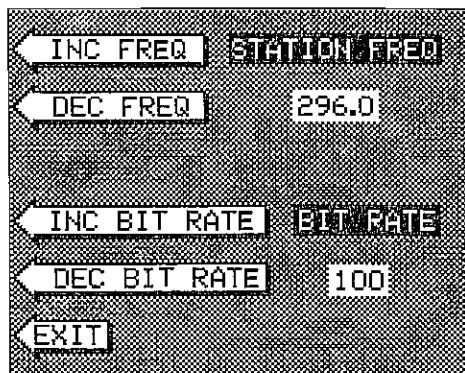
The UltraNav II can display navigation information in magnetic or true. When it's turned on for the first time magnetic is used. To switch to true, press the MENU key while a GPS screen is displayed. Next, press the key next to the "CHANGE GPS SETTINGS" label. Now press the key next to the "SELECT UNITS OF MEASURE" label. Now simply press the key next to the "BEARING" label. This moves the black box from "MAG" to "TRU." Press the key next to the "EXIT" label when you're finished.

DGPS (Differential GPS) BEACON RECEIVER SETUP

You'll have to tell the UltraNav II which beacon receiver's data to expect and set up the parameters for that data. To do this, first press the MENU key, then press the key next to the "CHANGE GPS SETTINGS" label. Now press the key next to the "SELECT NMEA" label. The screen on the previous page appears. Press the key next to the desired beacon receiver. The beacon receiver is selected, now you'll need to set it up for the frequency and bit rate of the station you'll be using in your area.

Repeat the above steps to get the NMEA screen as shown on the previous page. Now press the key next to the "SETUP BEACON" label. The screen shown below appears.

The station frequency and bit rate are shown on the right side of the screen. Press the key adjacent to the "INC FREQ" to increase the station frequency or the "DEC FREQ" to decrease it. Do the same for the bit rate. (NOTE: For automatic station selection on the Starlink MRB-2A **ONLY**, set the station frequency to zero and ignore the bit rate.) When the station frequency and bit rate are adjusted to their proper settings, press the key next to the "EXIT" label. The UltraNav II returns to the last used GPS screen. The letters "DGPS" appear next to the "POSITION" on all screens that show your present position, showing that the beacon receiver is working.



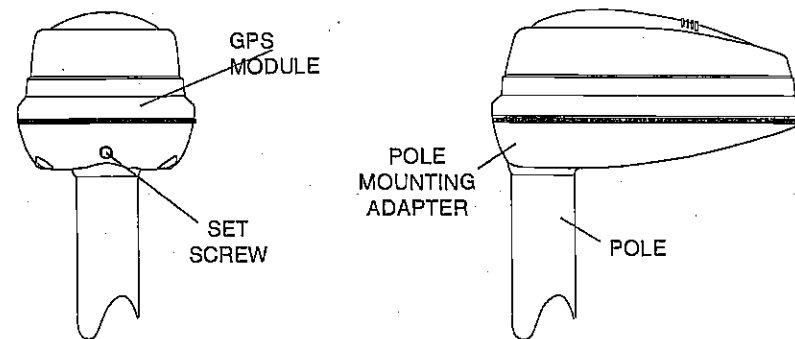
To view the status of the beacon signal, press the MENU key until the fourth menu page appears. Now press the key adjacent to the "DIFFERENTIAL GPS STATUS" label. If the beacon receiver is receiving data from the transmitter and is connected properly to the UltraNav II, a screen similar to the one shown at right appears.

DGPS STATUS						
STAT ID:	1	FREQ:	296.0			
HEALTH:	0	BIT:	100			
SIGNAL:	053	SNR:	31			
PRN STAT UORE TIME SA						
1	15	OK	OK	OK	OFF	
2	13	OK	OK	OK	OFF	
3	02	OK	OK	OK	ON	
4	27	OK	OK	OK	ON	
5	26	BAD	OK	BAD	ON	
← CLEAR						

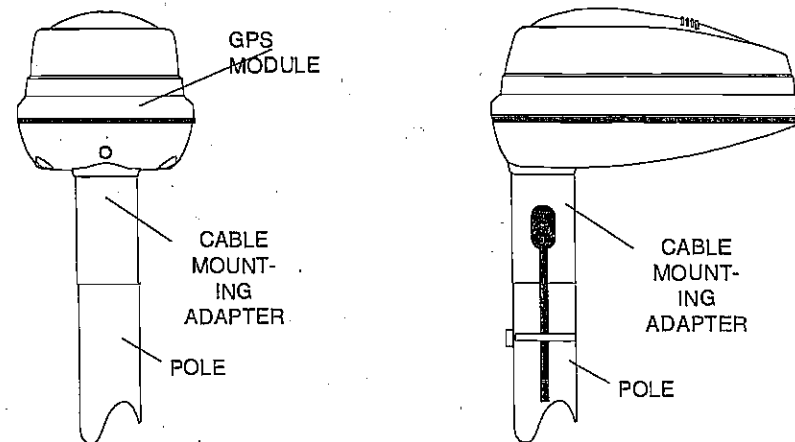
This page shows the station ID number, its frequency and bit rate, the "health" of the station (0 = best, 5 = worst), signal

Pole Mount

First, thread the pole mounting adapter onto the mounting pole or ratchet base. Align the pole mounting adapter so the module will face the bow of the boat. Install and tighten the set screw into the pole mounting adapter and tighten it securely. This should prevent the GPS module from unscrewing from the pole. Place the gasket onto the pole mounting adapter. Now attach the cable to the GPS module and pass the cable through the gasket, pole mounting adapter, and pole. Set the GPS module on top of the pole mounting adapter and align the four threaded holes in the module with the holes in the pole mounting adapter. Using the four stainless steel 5 mm screws and lock washers supplied with the UltraNav II, attach the pole mounting adapter to the GPS module. This completes the assembly.



If the pole or mast you're using isn't hollow or if the hole in the middle of the pole is too small for the connectors, use the cable mounting adapter supplied with your unit. Thread the cable mounting adapter into the GPS pole mounting adapter. Then thread the pole into the cable mounting adapter. Route the cable down the outside of the pole.



TRANSDUCER CONNECTIONS

See the transducer owner's manual included with the unit for complete transducer installation instructions.

SIDE SCAN

The UltraNav II has optional side-scan capability. To use this feature, you must purchase the ScanPac accessory. To install it, follow the instructions enclosed with the ScanPac.

See the "Side Scan Operation" section in this manual for information on using the side-scan feature.

SPEED/TEMPERATURE/DISTANCE LOG

To use the speed, temperature, and distance log features, you must install an optional speed/temperature sensor. Eagle manufactures a thru-hull sensor/transducer combination unit and a transom mount speed/temp only sensor that can be used with the UltraNav II.

KEYBOARD

The keyboard has keys arranged in two vertical columns plus a horizontal row at the bottom. The keys in the left column are used to enter numbers and menu selections. The keys in the right column activate the windows feature and the basic sonar functions. The menu key in the bottom right corner of the keyboard activates the first menu page. The keys along the bottom of the screen are used to activate the alarm menu, stop the chart, and make menu selections with the arrow keys.

WINDOWS - This key gives you access to the windows mode, which lets you customize displays.

SENS - Press this key to adjust the unit's sensitivity and Grayline.

RANGE - This key lets you adjust the range when the unit is in the manual mode.

ZOOM - The UltraNav II gives you 2X and 4X zoom capability with this key.

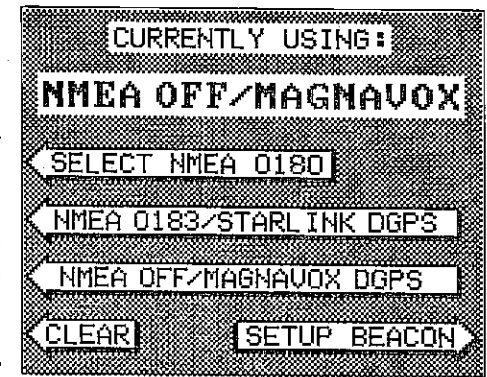
AUTO - This turns the automatic feature off and on.

MENU - Press this key to show the menus and gain access to most functions.

SELECT NMEA

The UltraNav II sends data out the white wire on the power cable according to standards set by the NMEA (National Marine Electronics Association). This allows the UltraNav II to send position, depth, and navigation information to "listener" units, such as charting instruments, autopilots, and other marine instruments. The UltraNav II uses the following NMEA data protocols: NMEA 0180 and 0183. NMEA 0180 sends steering information only. It's useful mainly for autopilots. NMEA 0183 sends depth, position, steering, speed, and more. In order to use this feature, the white wire on the power cable must be connected to the NMEA data input on the other instrument. See the installation section in the front of this manual for wiring connection information.

The UltraNav II also has the capability to receive differential data from a beacon receiver. This gives the unit much better accuracy than normal. However, before purchasing and installing a beacon receiver, make certain there are transmitters in the area you wish to use. Presently, the UltraNav II can use the Magnavox MX-50R or StarLink MRB-2A. Please note that the UltraNav II doesn't send NMEA 0183 data when the Magnavox MX-50R beacon receiver is activated.



NMEA SETUP

Once you connect the wiring properly, the UltraNav II must be told which NMEA data format to use. Consult the owner's manual of the other equipment to see which format it needs. Then set the UltraNav II as follows:

First, press the MENU key. Next, press the key next to the "CHANGE GPS SETTINGS" label. Now press the key next to the "SELECT NMEA" label. The screen shown above appears.

The data format currently in use shows at the top of the screen. Press the key next to the desired data output. Now press the CLEAR key. The UltraNav II will return to the last used GPS screen and send NMEA data out the white wire on the power cable.

ARRIVAL ALARM

The arrival alarm sounds a tone when your position is within the alarm's radius of a waypoint. For example, the alarm sounds if you come within .1 mile of a recalled waypoint if the arrival alarm's setting is .1 mile. The alarm is adjustable from .01 to 9.9 miles.

XTE ALARM

The XTE (cross track error) alarm sounds a tone when your cross track error is greater than the alarm's setting. Changing the XTE alarm also changes the XTE range on the steering screen. The alarm is adjustable from 0.0 to 9.9 miles.

ANCHOR ALARM

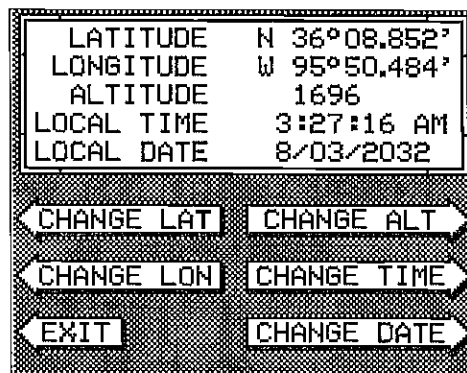
The anchor alarm sounds a tone when the present position moves outside a preset radius. For example, if you set the anchor alarm to .1 nautical mile (600 feet), then the alarm will sound if you move more than 600 feet from the location where you set the alarm. It's adjustable from 0.01 to 9.9 miles.

CHANGING GPS SETTINGS

The UltraNav II must be initialized when it's turned on for the first time. This is described at the beginning of the GPS section in this manual. However, if you wish to change only one of the parameters (such as time), use the menu features in the "CHANGE SETUP" menu. To do this, press the MENU key, then press the key next to the "CHANGE GPS SETTINGS" label. Finally, press the key next to the "SET LAT, LON, ALT, TIME, DATE" label. The screen shown below appears.

Using the menus on this and following menu pages, you can change the Initial Position, Time-Date-Time Offset, or Altitude without affecting any other initialization setting. All of these menus work identically to the ones described in the initialization section at the beginning of the GPS section. After you make a change, the unit returns to the GPS or plotter screen.

You may need to re-initialize the unit if you move a long distance (over 100 miles) with the unit off. In this example you would need to enter a new initial position to help the UltraNav II find the correct satellites quicker.



SONAR - Pressing this key switches the UltraNav II into the full screen sonar mode.

GPS - This key gives you access to all of the GPS navigation features.

PLOTTER - Press this key to display the plotter.

WAYPT - Pressing this key lets you save or recall a waypoint.

WAYPOINT QUICK SAVE - Press this key to instantly save your present position.

CLEAR - This key clears menus and erases entries from the screen.

EVENT MARKER - To mark a location on the plotter screen, use this feature.

MAN OVERBOARD - Pressing this key instantly saves your present position and switches the unit into a mode that shows navigation data to the last saved position.

ARROW KEYS - These keys are used to make menu selections and to move objects on the screen.

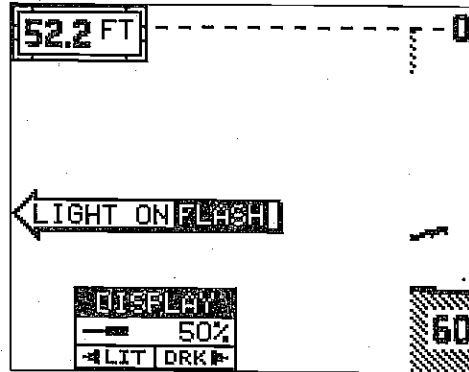
ON - The ON key turns the UltraNav II on.

OFF - Press and HOLD the Off key to turn the UltraNav II off.

DISPLAY - General

The lights are turned on for approximately ten seconds when the UltraNav II is first turned on. Menus appear at the same time. To keep the lights on, press the key adjacent to the Light label. It controls the backlighting used on the display and keyboard. If you don't want the lights on, wait ten seconds and the lights will automatically turn themselves off. The menus will also disappear after ten seconds, or you can turn them off by pressing the CLEAR key at the bottom of the screen.

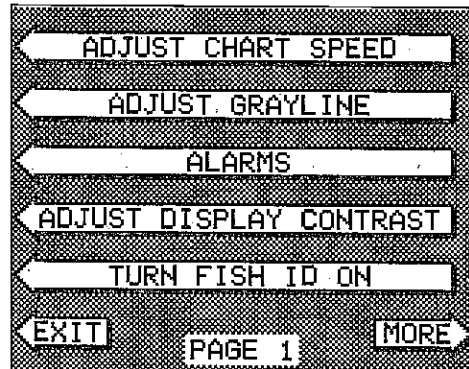
The Display menu at the bottom of the screen lets you adjust the display's contrast for the best viewing angle. Pressing the left arrow key decreases the contrast, the right arrow key increases it. After setting the contrast for the best viewing angle, press the CLEAR key to erase the menu or wait approximately ten seconds and it will automatically erase. See the Display Contrast section for more information on this feature.



When the UltraNav II is first turned on, the display will appear similar to the one above. The word "AUTO" in the upper left corner of the display indicates the automatic feature is on. The digital bottom depth is also displayed in this box.

MENUS

The UltraNav II uses menus extensively to guide you through the functions and features of the unit. The menu key accesses many of these features, allowing you to customize the unit to your particular needs and water conditions. Although you may have to leave one menu and enter another to reach the desired function, all you have to do is press the menu key to select the next menu. If you ever get lost in a menu, simply press the CLEAR key.



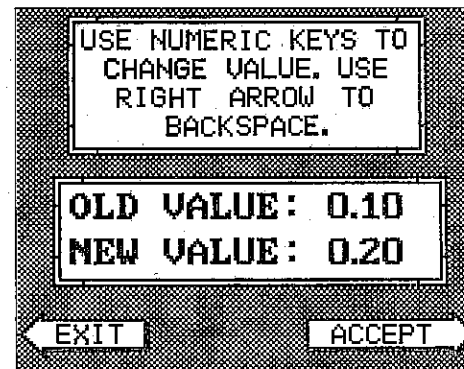
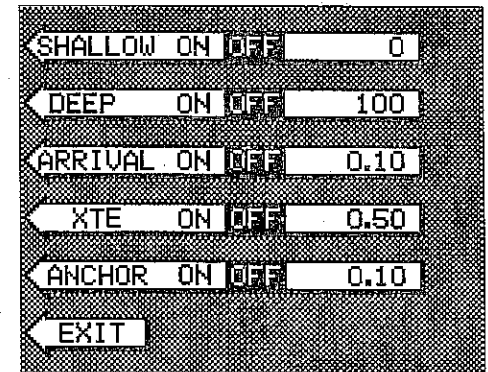
ERASING A ROUTE

To create a route, first press the MENU key while the unit is in the GPS mode. Next, press the key next to the "More" label. Now press the key next to the "ROUTE PLANNING" label. Route number one appears on the right side of the screen. The list of waypoints used in the route are shown beneath the route number and name. If you wish to erase a different route, press the key next to the "+RTE" or "-RTE" labels to cycle through the available routes.

After you've selected the desired route, press the key next to the "ERASE RTE" label. This erases the route from memory. Finally, press the key next to the "EXIT" label. This returns you to the GPS display.

GPS ALARMS

The UltraNav II's GPS receiver has an Arrival Alarm, Cross Track Error (XTE) Alarm, and an Anchor Alarm. All of these alarms adjust identically to the sonar alarms. To adjust any of these alarms, first press the MENU key. Now press the key adjacent to the "ALARMS" menu. The screen shown at right appears. Press the key next to the desired alarm. Now press the key next to the "CHANGE VALUE" label. The screen shown below appears. Use the numbered keys to set the alarm. For example, to set the arrival alarm to .2 miles, press the 0 key, then the 2 key; finally press the 0 key. When the desired value has been entered, press the key next to the "ENTER" label. The unit returns to the ALARMS screen.



The following section describes each GPS alarm and its limits.

No matter if you travel forward or reverse through the route, when you reach the last waypoint in the route, the arrival alarm sounds until you turn it off.

IMPORTANT!

Turning the arrival alarm off prevents the UltraNavII from sequencing to the next waypoint in the route. This, in effect, turns the route off. However, the unit will still show navigation data to the current waypoint in the route at the time the arrival alarm was turned off.

CANCEL NAVIGATION

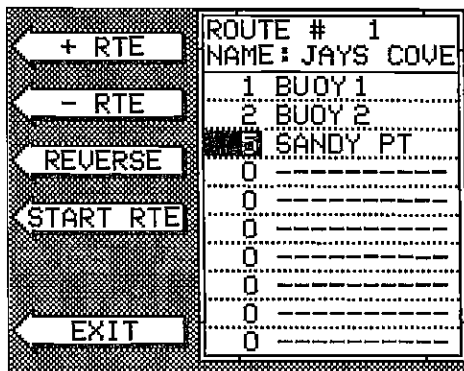
To stop the UltraNav II from navigating to waypoint or navigating to a waypoint in a route, press the GPS key, then press the MENU key twice. Now press the key next to the "CANCEL NAVIGATION" label. This stops all navigation.

NOTE:

Canceling navigation does not erase the route or any waypoints from memory. It merely stops the UltraNav II from navigating.

MODIFYING A ROUTE

Any part of a route can be changed at any time. For example, suppose you have a route consisting of waypoints number 1, 2, and 3 and you wish to change waypoint number 3 to waypoint number 5. Simply press the MENU key, then press the key next to the "More" label. Next, press the key next to the "Route Planning" label. Finally, press the key next to the "Recall Route" label. Route number one appears on the right side of the screen. The list of waypoints used in the route are shown beneath the route number and name.

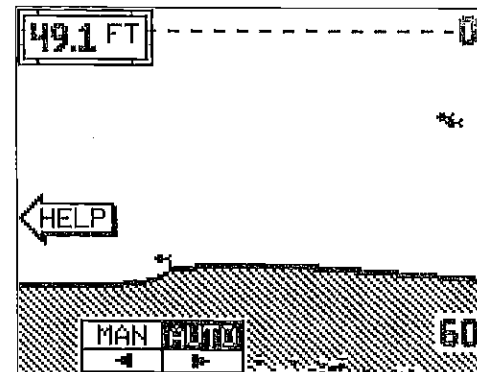


Using the down arrow key, move the black box to waypoint number 3. Now press the key next to the "CHANGE" label. Use the numbered keys to change the waypoint from 3 to 5. Next, press the key next to the "ACCEPT" label. You've changed the waypoint from 3 to 5. Finally, press the key next to the "EXIT" label and you're finished.

Remember, any part of the route can be changed at any time.

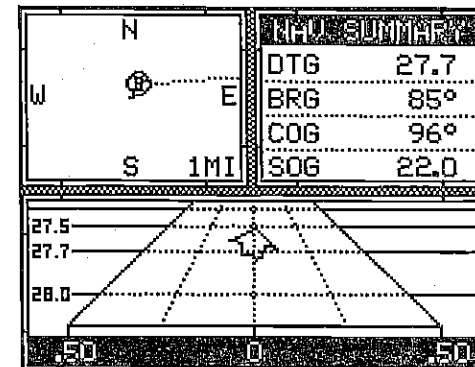
HELP

An extremely useful feature incorporated into the UltraNav II series is the Help menu. Virtually every feature has a help menu label that, when pressed, gives one or more pages of text describing how to use that feature. For example, pressing the AUTO key brings up a menu letting you switch the unit into or out of the automatic mode. A help label also appears on the screen. Pressing the key adjacent to the help label gives you a description of how automatic works and how it affects different functions.



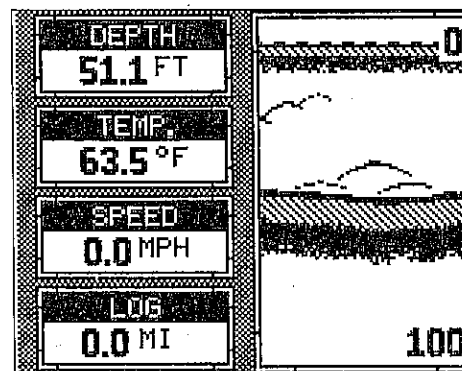
WINDOWS

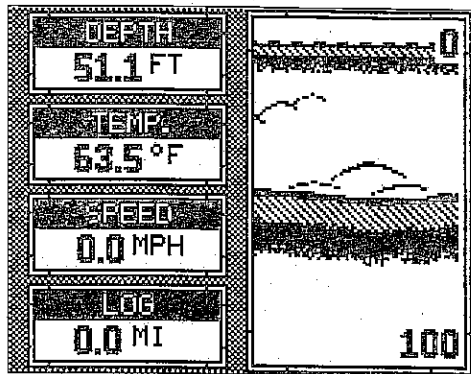
You can change the displays on the UltraNav II by using the windows feature. This lets you use different displays for your own fishing or boating situations. This feature gives you 23 different window display screens.



The screens available in the windows mode are divided into two or more windows per screen.

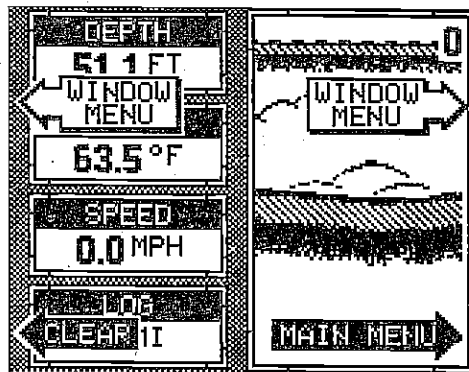
Each combination of windows is called a "group". Group "A" as shown below has the digital displays in one window and the sonar chart in the other. A group of windows can be as many as four, or only one. A window can display sonar chart data, digital sonar data, digital GPS data, GPS steering or navigation displays, and many more.





To use the windows feature, first press the WINDOWS key. A screen similar to the one shown at left appears. The menu at the bottom of the screen lets you switch between the "pages" of displays. These are lettered "A" through "W". Group "A" shows first. Press the down arrow key to move forward through the screens.

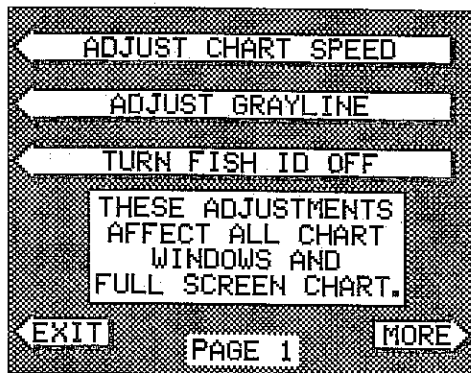
Press the up arrow key to move backward. For example, pressing the down arrow key once shows the group "B" screen which is the side scan screen. To return to the full sonar screen, simply press the SONAR key.



Every one of the group screens can be modified to some extent. For example, press the MENU key while group "A" is displayed. Four new labels appear on the display as shown above. Two of these labels are window menus. Pressing the key adjacent to one of the "window menu" labels gives you a menu with functions that relate only to that window. For example, if you press the key adjacent to the window menu label on the

sonar chart window, the screen will clear and you will have a new menu with selections such as "ADJUST CHART SPEED" and "ADJUST GRAYLINE" as shown at left. Other window menus let you change the units of measure or adjust alarms.

To exit from a window menu, press the CLEAR key.



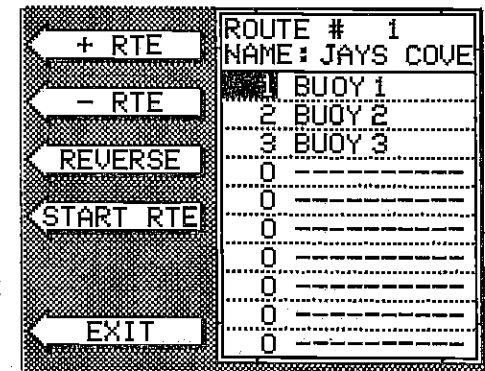
The cursor should now be on the second waypoint line. Again, press the key next to the "CHANGE" label and enter the waypoint number for the second waypoint in the route. Continue entering the waypoints until all of the waypoints have been entered for the route. Then press the key next to the "EXIT" label. This saves your route in memory.

IMPORTANT!

You must select waypoints in the order they are to be used in the route. In other words, suppose you want a route that consists of waypoint numbers 1, 3, and 5. However, you wish to travel to 3 first, then 1, and finally 5. In this case, you must select waypoint 3, 1, and 5 in that order when making the route.

FOLLOWING A ROUTE

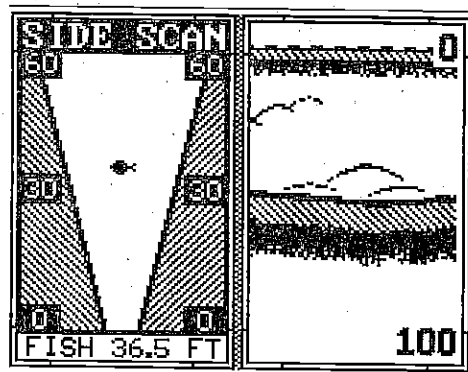
To follow a route, press the MENU key, then press the key next to the "More" label. Next, press the key next to the "Route Planning" label. Finally, press the key next to the "Recall Route" label. The screen shown below appears. Route number one appears on the right side of the screen. The list of waypoints used in the route are shown beneath the route number and name. If you wish to recall a different route, press the key next to the "+RTE" or "-RTE" labels to cycle through the available routes.



After you've selected the desired route, you'll notice a black box surrounding the first waypoint in the route. This is the starting waypoint box. If you wish to start the route using the first waypoint in the route, simply press the key next to the "START RTE" label. However, if you wish to start the route using a different waypoint, simply use the down arrow key to move the black box to the desired waypoint number. Then press the key next to the "START RTE" label.

To follow a route backwards, press the key next to the "REVERSE" label. For example, suppose you have three waypoints in a route and they're numbered 3, 6, and 2. If you travel forward through the route, the unit will show navigation data to waypoint number 3 first, then 6, and finally 2. If you travel backward through the route, the unit will start with waypoint number 2 first, then 6, and end with waypoint number 3.

To change the range, press the RANGE key. A new menu appears at the bottom of the display. Use the up or down arrow keys to change the range of the side scan mode from ten to sixty feet. Either wait a few seconds after you've changed the range and the menus will automatically disappear or press the CLEAR key to erase the menus.

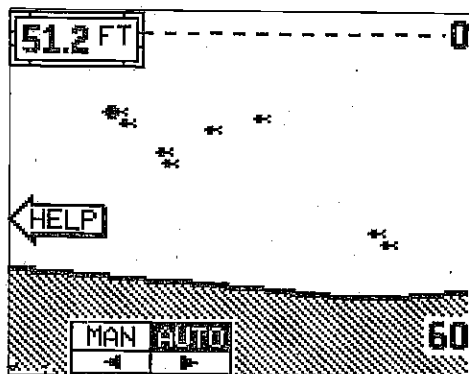


Group "L" as shown at right and group "U" also use the side scan displays along with other windows. See the windows summary on page 39 for a complete listing of all the window groups.

SONAR OPERATION - AUTOMATIC

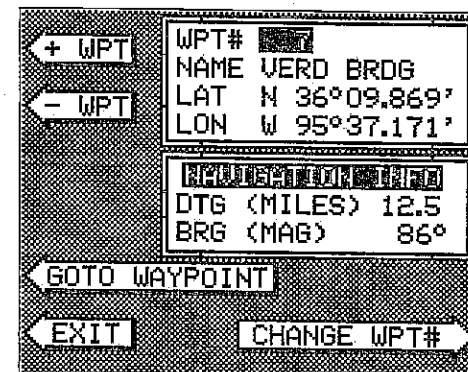
When the UltraNav II is first turned on, the Automatic feature is enabled. This is indicated by the word "AUTO" at the top of the screen. The Automatic feature adjusts the sensitivity and range so the bottom signal is displayed in the lower half of the screen at all times.

To turn Automatic off, first press the AUTO key. A menu appears at the bottom of the screen above the left and right arrows. Press the left arrow key to switch to the manual mode. The letters "Man" appear in the upper left corner of the display, indicating the unit is in the manual mode. To turn Automatic on, press the AUTO key again, then press the right arrow key.



key next to the "WPT RECALL" label. The screen shown below appears.

Now press the key next to the "+ WPT" or "-WPT" label until the desired waypoint number appears on the screen. When it does, simply press the key next to the "GO TO WYAPOINT" label. The UltraNav II returns to the last used sonar, navigation, or plotter screen, showing navigation data to the waypoint you recalled.



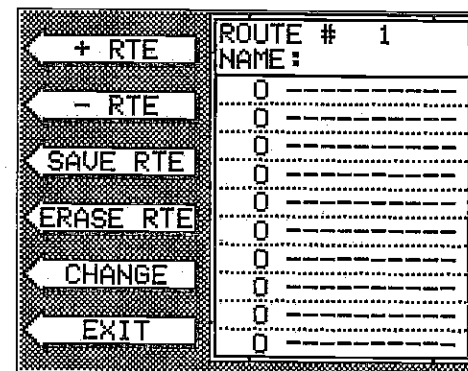
ROUTES

A route gives you the ability to navigate to several waypoints without having to re-program the unit after arriving at each one. A route consists of two or more waypoints. When you travel on a route, the UltraNav II first shows navigation information to the first waypoint in the route. When you reach the first waypoint, (signalled by the Arrival Alarm), the UltraNav II automatically sequences to the next waypoint. Navigation information is shown to this waypoint and the process repeats. When you reach the last waypoint in a route, the arrival alarm sounds until you turn it off.

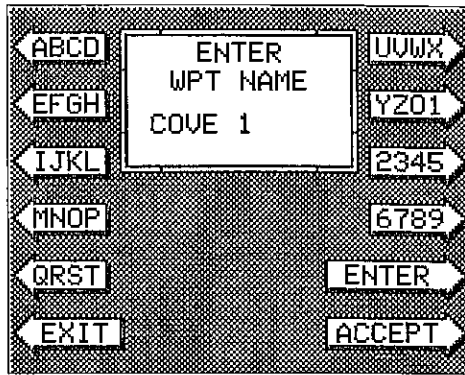
There are four steps required to create and follow a route. First, you must create and name the route. Next, select the waypoints used in the route. Then determine the starting waypoint. Next, tell the unit to follow the route. Finally, the unit will ask you if you wish to run the route forward or backward. After these steps are completed, the UltraNav II will start showing navigation data to the first waypoint on the route.

CREATING A ROUTE

To create a route, first press the MENU key while the unit is in the GPS mode. Next, press the key next to the "More" label. Now press the key next to the "ROUTE PLANNING" label. Finally, press the key next to the "SAVE/EDIT ROUTE" label. The screen shown at right appears.



Use the keys on both sides of the screen to enter the waypoint name. For example, to name a waypoint "COVE 1", press the number "0" key repeatedly until the letter "C" appears in the window. Next, press the right arrow key to move the black box to the next letter position. Now press the "3" key repeatedly until the letter "O" appears on the screen. Repeat this process until the entire name has been written on the screen. Now press the key next to the "ACCEPT" or "ENTER" label. The UltraNav II returns to the waypoint save menu as shown above. To save the waypoint with this name, first press the key next to the "SAVE" label. Now press the key next to the "EXIT" label to exit the waypoint save menu.



Erase a Waypoint

The Waypoint Erase feature lets you erase waypoints from the list.

To erase a waypoint, first press the WAYPT key, then press the key next to the "WAYPT SAVE" label. The screen shown at right appears. Now press the key next to the "+ WPT" or "-WPT" label until the desired waypoint number appears on the screen. Simply press the key next to the "ERASE" label. A message appears on the screen that says "WAIT!! DELETE WAYPOINT ARE YOU SURE?". If you are certain this is the waypoint that you wish to erase, press the key next to the "YES" arrow. If not, press the key next to the "NO" arrow. Press the key next to the "YES" arrow erases all information from the waypoint number that appears at the top of the screen.



To exit from the waypoint save menu, press the CLEAR key.

RECALL A WAYPOINT

You must recall a waypoint in order to navigate to that position with the UltraNav II. To recall a waypoint, first press the WAYPT key, then press the

SENSITIVITY

The sensitivity key on the UltraNav II controls the ability of the unit to pick up echoes. A low sensitivity level excludes much of the bottom information, fish signals, and other target information. High sensitivity levels enables you to see this detail, but it can also clutter the screen with many undesired signals. Typically, the best sensitivity level shows a good solid bottom signal with Grayline and some surface clutter.

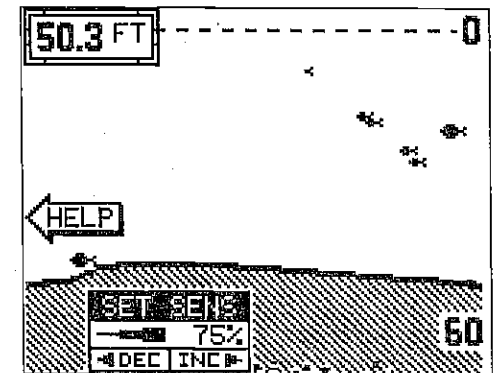
When the UltraNav II is in the Automatic mode, the sensitivity is automatically adjusted to keep a solid bottom signal displayed, plus a little more. This gives it the capability to show fish and other detail.

However, situations occur where it becomes necessary to increase or decrease the sensitivity. This typically happens when you wish to see more detail, so an increase in sensitivity is indicated. The procedure to adjust it is the same whether the unit is in the automatic or manual mode.

To adjust the sensitivity, press the SENS key. The sensitivity adjust menu appears at the bottom of the screen.

The sensitivity menu has left and right arrows, plus a horizontal bar graph. The graph gives a visual indication of the sensitivity level. The number above the INC arrow also shows the percentage of sensitivity in use.

To increase the sensitivity level, press the right arrow key. As you press the key, the menu's bar graph will grow wider and the percentage will increase in value. You can also see the difference on the chart record as it scrolls. When the sensitivity is at the desired level, release the key.



To decrease the sensitivity level, press the key adjacent to the left arrow. The bar graph and percentage will decrease. When the sensitivity is at the desired level, release the key.

When you reach either the maximum or minimum limit, a tone sounds. To turn the menus off, press the key adjacent to the CLEAR key at the bottom left side of the unit or wait a few seconds and the menu will disappear.

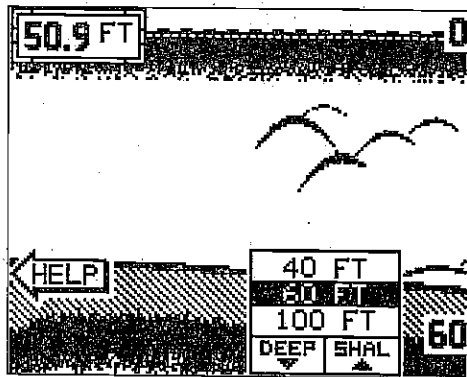
RANGE - Automatic

When turned on for the first time, the UltraNav II automatically places the bottom signal in the lower half of the screen. This is called Auto Ranging and is part of the automatic function. The range cannot be changed manually while the unit is in automatic.

RANGE - Manual

The UltraNav II gives you control over the range when it's in the manual mode.

To change the range, first make certain the UltraNav II is in the manual mode. Next, press the RANGE key. The range adjustment menu appears in the lower right corner of the display. Press the up or down arrow keys to decrease or increase the range. The available ranges are 0-5, 10, 20, 30, 40, 60, 100, 150, 200, 300, 500, 800, 1000, 1500, 2000, 3000, and 5000 feet. After the desired range is displayed, press the CLEAR key to erase the range menu.



NOTE: The depth capability of the UltraNav II depends on the transducer installation, water and bottom conditions, and other factors.

ZOOM

Enlarging or "zooming" the picture is a common method used to show small detail and fish signals. The UltraNav II gives you two different zoom sizes, plus a split screen zoom option. The zoom operation and adjustment is different in the automatic and manual modes.

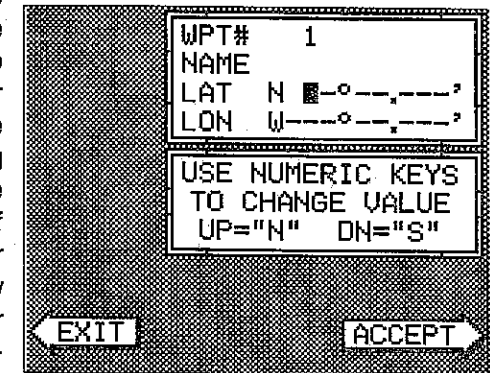
ZOOM - AUTOMATIC MODE

To zoom the display in the automatic mode, first press the ZOOM key. All targets on the display are enlarged four times normal size automatically. The menus shown at the top of the next page also appear.

Turn the zoom feature on (or off) by pressing the key adjacent to the "OFF/ON" label.

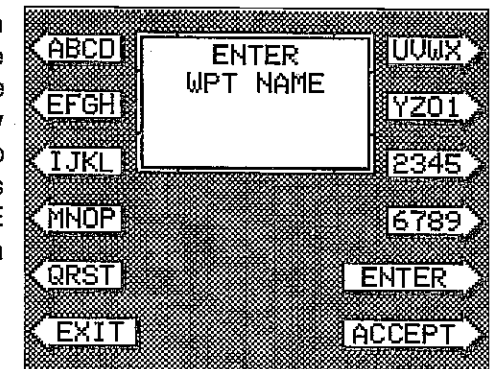
Enter New Waypoint

To save a location other than your present position, first press the WAYPT key. Then press the key next to the "WPT SAVE" label. The screen shown below appears. Using the up and down arrow keys, move the black box down to the latitude/longitude position. Now press the key next to the "CHANGE FIELD" label at the bottom right corner of the screen. Use the arrow keys to change the "N" to a "S", if your latitude is south. Now enter the location you wish to save using the numbered keys. Use the left arrow key as a backspace if you make a mistake. In other words, pressing the left arrow key moves the black box over the last number entered. Notice that the position entered is in degrees, minutes, and hundredths of a minute. (Not seconds!) After you've entered the latitude, press the key next to the "ACCEPT" label. The waypoint save menu reappears. Next, press the key next to the "CHANGE FIELD" label. Press the down arrow key to switch the longitude from west to east, if necessary. Now enter the longitude. Make certain to add a zero to the longitude if it's less than 100 degrees. For example, if the longitude is 85 degrees, then enter "085". Press the key next to the "ACCEPT" label when you've finished. The save waypoint menu appears with the position you entered in the waypoint position box at the top of the screen. If this position is correct, press the key next to the "SAVE" label.



Name a Waypoint

To assign a name to a waypoint, press the WAYPT key, then press the key next to the "WPT SAVE" label. The waypoint save menu appears. Press the key next to the "+WPT" or "-WPT" label to move through the list of waypoints. When the desired waypoint appears in the window, press the down arrow key until the black box moves to the "NAME" position. Now press the key next to the "CHANGE FIELD" label. The screen shown at right appears.



Saving Present Position as a Waypoint (Quick Save Feature)

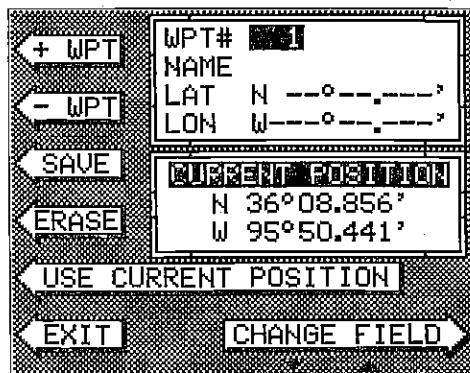
The UltraNav II lets you save your present position as a waypoint with only one key press. This "Quick Save" feature lets you easily save the position of a wreck or other locations.

To save your present position as waypoint, simply press the WAYPT QUICKSAVE key. The UltraNav II takes your present position and assigns the first available waypoint number to it.

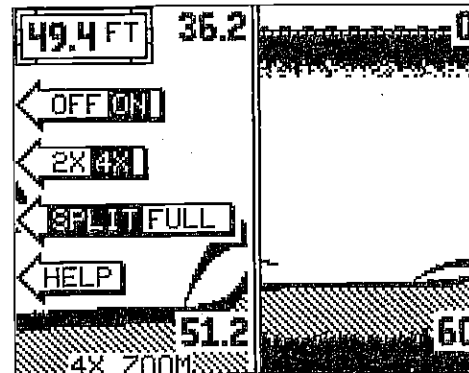
Saving Present Position - View and Save Method

The "Quick Save" feature doesn't let you select the waypoint number. You have to use the next available number when using that method. The View and Save method lets you pick the waypoint number that your present position is stored in. (Note: You can store a position under a waypoint number that already has a position assigned to it using this method.) To save your present position, press the WAYPT key. Now press the key next to the "WPT SAVE" label. A screen similar to the one below appears.

The first waypoint number in the list appears at the top of the page. This is the number that your present position will be stored under. Your position at the time you pressed the WAYPT key is shown in the "CURRENT POSITION" box in the middle of the screen. If you wish to save the location in the CURRENT POSITION box under this waypoint number, simply press the key next to the "USE CURRENT POSITION" label. The position shown in the CURRENT POSITION box also will show in the waypoint location at the top of the screen. To save the waypoint without naming it, simply press the key next to the "SAVE" label.



To save the location under a different waypoint number, press the key next to the "+ WPT" label to increase the waypoint number (i.e. from waypoint number 1 to 2). Press the key next to the "- WPT" label to decrease the waypoint number. Once you've decided the waypoint number to save the location under, press the key next to the "USE CURRENT POSITION" label. Then press the key next to the "SAVE" label. This will store the location under the waypoint number you selected and return to the last used position, plot, or navigation screen.



Pressing the key adjacent to the "2X/4X" label enlarges echoes from two times to four times their normal size.

To switch between the split screen zoom and full screen zoom, press the key adjacent to the "SPLIT/FULL" label. The screen instantly splits into two sections. All targets on the left are shown at four times the

size of the ones on the right. If you switch to the 2X zoom mode, echoes on the left side of the screen are shown at twice the size as the ones on the right. The echoes that scroll across the screen are the exact same echoes on both sides of the screen. They're simply enlarged on the left side. This feature tracks the bottom, keeping it on the display at all times, when the automatic feature is on. Once you've set the zoom as desired, press the CLEAR key to erase the menu.

ZOOM - MANUAL MODE

When you press the zoom key while the unit is in the manual mode, the screen shown below appears. All of the menus on this screen work identically as described above. However, one additional menu item is shown when the unit is in the manual mode: "ADJUST".

To adjust the zoom, press the key adjacent to the "ADJUST" label. A screen similar to the one below appears. A zoom bar and adjust arrows appear on the screen. The echoes on the left side of the screen are the ones that appear between the top and the bottom of the zoom bar. Press the up or down arrow keys to move the zoom bar up or down. As you adjust the zoom bar, the echoes move on the left side of the screen at the same time. The zoom adjust menus will automatically clear a few seconds after you've pressed the last key. Remember, the UltraNav II won't track the bottom when it's in the manual mode.

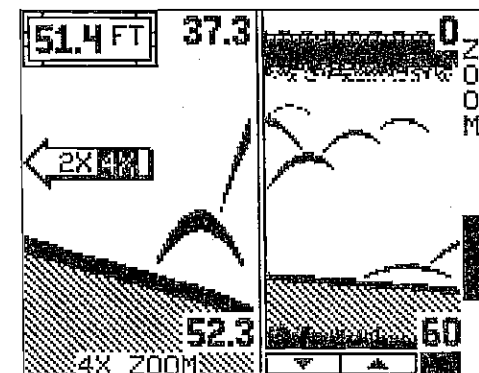


CHART SPEED

The rate echoes scroll across the screen is called the chart speed. It's adjustable by first pressing the menu key, then pressing the key adjacent to the "ADJUST CHART SPEED" label. The chart speed menu appears at the bottom of the screen. Increase the chart speed by pressing the right arrow key or decrease it by pressing the left arrow key. The percentage of

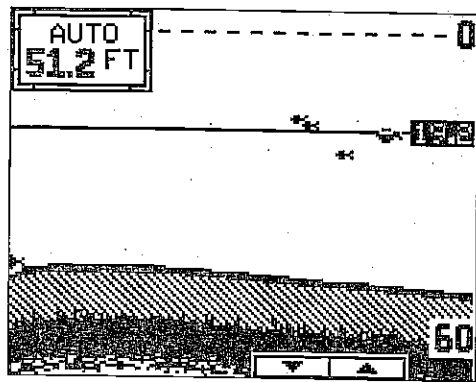
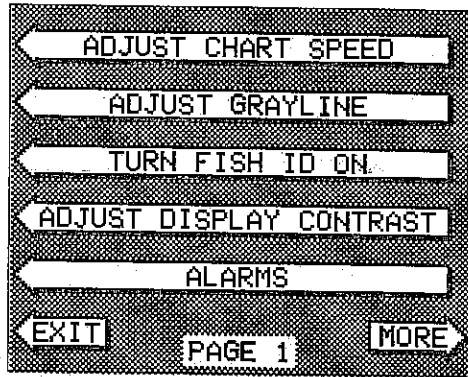


chart speed in use changes as the arrow keys are pressed. The bar chart also gives a graphical indication of the chart speed. You can see the change on the screen (both on the menu and on the chart record) as you press the keys. After you've made the adjustment, press the CLEAR key to erase the menu.

To stop the chart, press the key adjacent to the "STOP" label.

To start the chart, press the key adjacent to the "START" label.

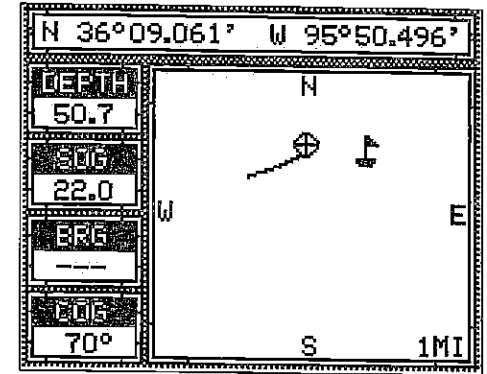
GRAYLINE®

GRAYLINE lets you distinguish between strong and weak echoes. It "paints" gray on targets that are stronger than a preset value. This allows you to tell the difference between a hard and soft bottom. For example, a soft, muddy or weedy bottom returns a weaker signal which is shown with a narrow or no gray line. A hard bottom returns a strong signal which causes a wide gray line.

If you have two signals of equal size, one with gray and the other without, then the target with gray is the stronger signal. This helps distinguish weeds from trees on the bottom, or fish from structure.

GRAYLINE is adjustable. Since GRAYLINE shows the difference between strong and weak signals, adjusting the sensitivity may require a different GRAYLINE level, also. The level chosen by the UltraNav II at power on is

cursor. To do this, first press one of the arrow keys. This makes the plotter cursor lines appear on the display. Now move the lines to the desired position on the display by pressing the arrow keys. When it's at the desired location, press the EVENT MARKER key, then select an icon. The UltraNav II places the icon at the intersection of the plotter cursor lines.



To erase the cursor lines, press the CLEAR key.

Erasing the Icons

Although you can place icons on the plotter individually, you can't erase them one at a time. You have to erase the whole group of icons. For example, if you've place 20 fish symbol icons, erasing one of them erases all 20.

To erase an icon, first press the EVENT MARKER key. Next, press the key next to the "DELETE ICON BANK" label. The screen shown below appears.

Now select the group of icons that you wish to erase by pressing the key next to the desired icon. After pressing the key, the UltraNav II erases all of the selected icons from the plotter.



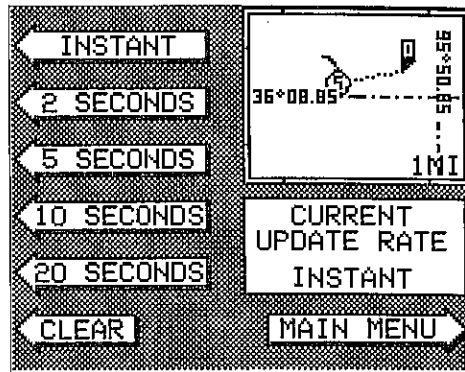
WAYPOINT NAVIGATION

HOW TO SAVE A WAYPOINT

Waypoints are locations on the earth's surface that you wish to go or return to. Waypoints are useful for marking shipwrecks, hot fishing spots, and other fishing or navigation locations. Storing waypoint's in the UltraNav II's memory makes it easy to return to any point in the world by simply pressing a few buttons. The UltraNav II can store up to 200 waypoints. You can store your present position as a waypoint or enter latitude/longitude positions as waypoints.

PLOTTER UPDATE

The plotter shows your track by drawing a solid line behind your present position. The track is updated once every instantly when the unit is turned on for the first time. However, if you're travelling a long distance, the track line may end prematurely due to the limited number of dots available that plot the track. Using a longer update time To change the update rate, press the MENU key while the unit is in the plotter mode. Now press the key next to the PLOT UPDATE label. The screen shown above appears. The available plot update times are instant, 2, 5, 10, and 20 seconds. Simply press the key next to the desired update time. The UltraNav II immediately returns to the plotter screen using the new time.

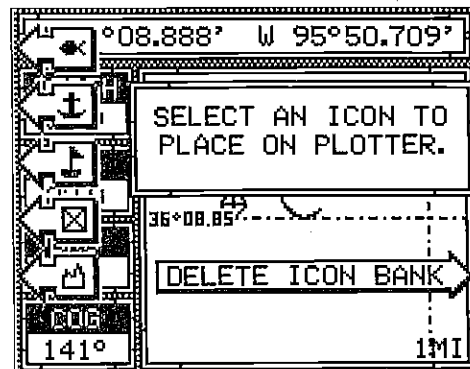


EVENT MARKER

The UltraNav II can place event markers or "icons" on the plotter to mark fishing spots, shallow water, or other special locations. There are five different icons to choose from and there are 100 of each icon for a total of 500. You can place each icon individually, however, you have to erase all of the icons in a group.

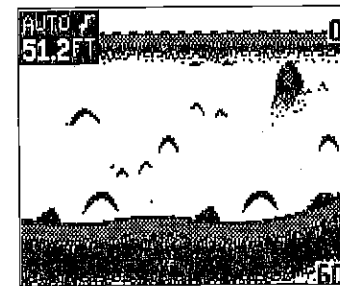
To place an icon, first press the EVENT MARKER key. The screen shown below appears.

Now select one of the five icons shown on the left side of the screen by pressing the key next to the desired icon. As soon as you press the key, the UltraNav II places the icon at your present position. This icon always stays in this location. It's saved in memory so it will always show on the display, even if the unit is turned off and on again.

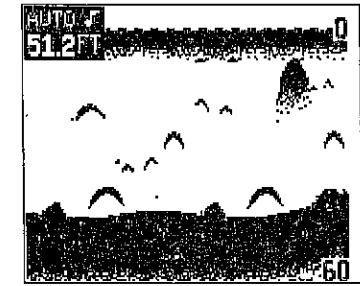


Using the Event Marker with the Cursor

Normally, when you select an icon, it's placed on the plotter at your present position. However, you can place an icon anywhere on the plotter using the



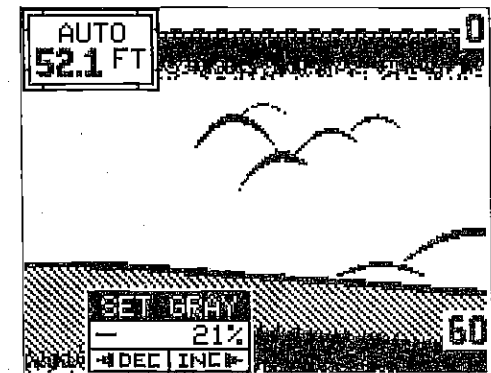
GRAYLINE® ON



GRAYLINE® OFF

usually adequate for most conditions. Experiment with your unit to find the GRAYLINE setting that's best for you.

To adjust GRAYLINE, press the MENU key, then press the key adjacent to the "ADJUST GRAYLINE" label. A screen similar to the one at right appears. Now press the left arrow key to decrease the gray level. Press the right arrow key to increase it. The percentage of GRAYLINE in use changes as the arrow keys are pressed. The bar chart also gives a graphical indication of the GRAYLINE level. You can see the change on the screen (both on the menu and on the chart record) as you press the keys. After you've finished, press the CLEAR key to erase the menu.



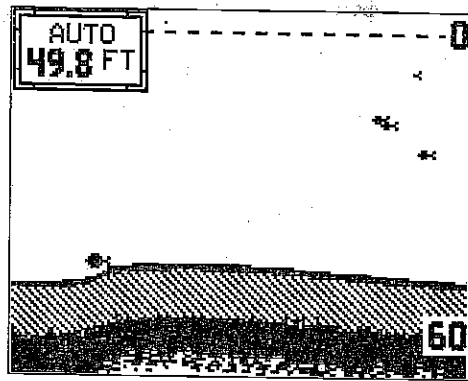
FISH I.D.

The Fish I.D. feature identifies targets that meet certain conditions as fish. The micro-computer analyses all echoes and eliminates surface clutter, thermoclines, and other signals that are undesirable. In most instances, remaining targets are fish. The Fish I.D. feature displays symbols on the screen in place of the actual fish echoes. There are four fish symbol sizes: tiny, small, medium, and large. These are used to designate the relative size between targets. In other words, it displays a small fish symbol when it thinks a target is a small fish, a medium fish symbol on a larger target, etc.

The micro-computer is sophisticated, but it can be fooled. It cannot distinguish between fish and other suspended objects such as trotlines,

turtles, submerged floats, air bubbles, etc. Individual tree limbs extending outwards from a group of limbs is the hardest object for the Fish I.D. feature to distinguish from fish. You may see Fish I.D. symbols on the screen when actually, there are no fish. Practice with the unit in the Fish I.D. mode to become more familiar with the Fish I.D. feature.

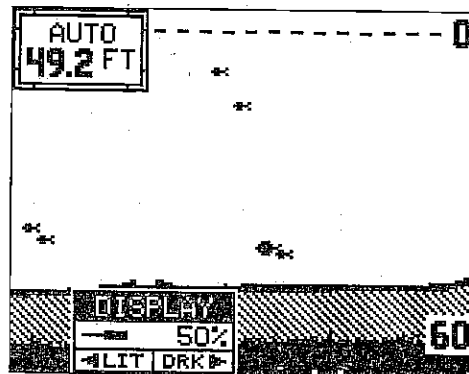
To turn the Fish I.D. feature on, press the menu key, then press the key adjacent to the "Turn Fish-ID On" label. Echoes will continue to scroll across the screen, however, the surface clutter at the top will no longer be displayed. Any targets the micro-computer determines are fish will be displayed as fish symbols. To turn the Fish I.D. feature off again, first press the menu key, then press the key adjacent to the "Turn Fish I.D. Off" label.



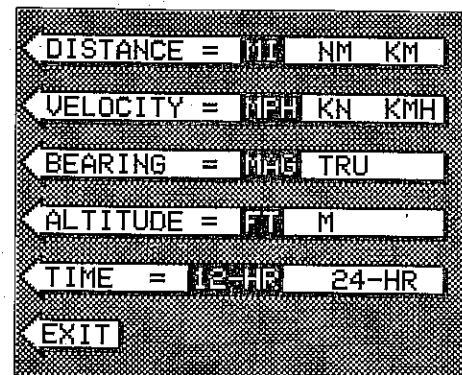
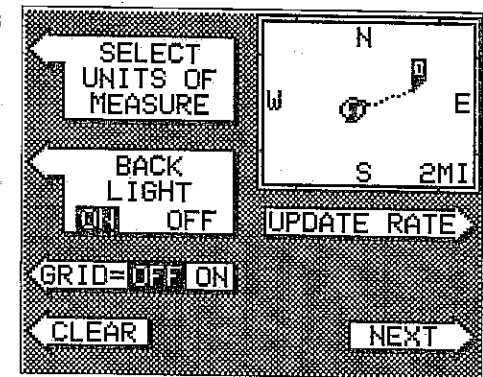
Remember, the Fish I.D. feature can't be used when the UltraNav II is in the manual mode. If you turn the Fish I.D. feature on when the UltraNav II is in manual, the micro-computer will turn the automatic feature on. If you turn automatic off when the Fish I.D. feature is on, the Fish I.D. feature will be turned off also.

DISPLAY CONTRAST

The unit's display contrast is adjustable to suit different lighting conditions. To adjust it, first press the menu key. The first menu page appears. Now press the key next to the "ADJUST DISPLAY CONTRAST" label. A screen similar to the one below appears. Now press the key adjacent to the left arrow to decrease the contrast. Press the key adjacent to the right arrow to increase it. The percentage of contrast in use changes as the arrow keys are pressed. The bar chart also gives a graphical indication of the contrast level. You can see the change on the screen as you press the keys. After you've made the adjustment, press the CLEAR key to erase the menu.



To change any these, first press the menu key twice. Next, press the key next to the "SELECT UNITS OF MEASURE" label. The screen shown below appears. The black box on each line shows the unit of measure currently in use. In the screen shown below, the units of measure are in statute miles for distance, miles per hour for velocity, degrees magnetic for bearing, altitude in feet, and time is in the 12 hour format (a.m./p.m.)



Press the key next to the unit that you wish to change. For example, press the key next to the Distance label twice to switch from miles to kilometers. This moves the black box two times from the "MI" to the "KM".

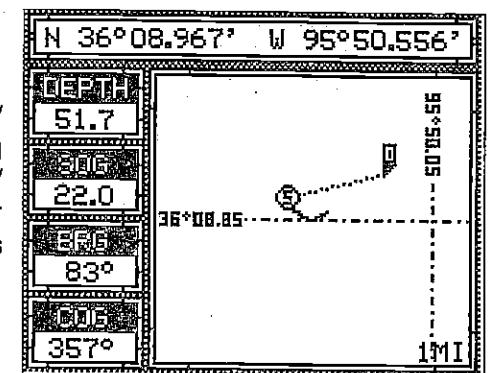
When you have the units of measure set as desired, press the key next to the "EXIT" label.

BACK LIGHT ON/OFF

To turn the back lighting on, press the menu key twice, then press the key next to the "BACK LIGHT" label. This moves the black box from "OFF" to the "ON" position. To turn the backlights off, repeat the steps.

GRID LINES

The plotter can show latitude/longitude grid lines by pressing the key next to the "GRID OFF/ON" label on the second plotter menu page. To turn the grid lines off, repeat the previous step.

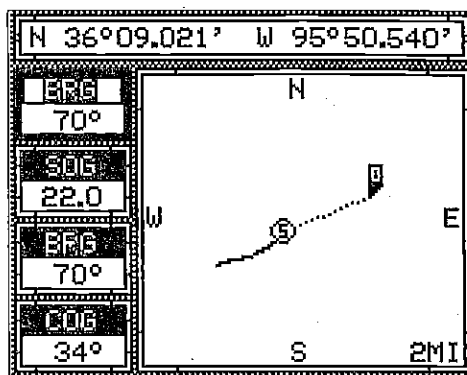


All of the navigation displays on the UltraNav II will show navigation data to the location you marked. This includes the navigation, steering, and plotter displays.

CHANGE DISPLAY

The four digital displays on the left side of the plotter screen can be changed or customized at will. When the UltraNav II is first turned on, or after it's preset, the four digital displays are Distance To Go (DTG), Speed Over Ground (SOG), Bearing to waypoint (BRG), and Course Over Ground (COG). The available displays that can be placed in these windows are: Distance To Go (DTG), Speed Over Ground (SOG), Bearing to waypoint (BRG), Course Over Ground (COG), Cross track error (XTE), Water depth (DEPTH), and Altitude (ALT).

To change any or all of the digital displays, first press the MENU key while the plotter is showing. Now press the key next to the "CHANGE DISPLAY" label. The unit returns to the plotter screen with a black box surrounding the DTG box. This means the DTG box is ready to be changed. Press the left or right arrow key to change the display. For example, to change the Distance To Go to Cross Track Error (XTE), press the right arrow key four times.



To change another digital box, press the up or down arrow key until the flashing box is on the desired display. Now press the right or left arrow key until the desired display appears.

When you have the digital displays customized, press the CLEAR key. This locks the screen displays, even if the unit is turned off and on again.

PLOTTER MENU - PAGE TWO

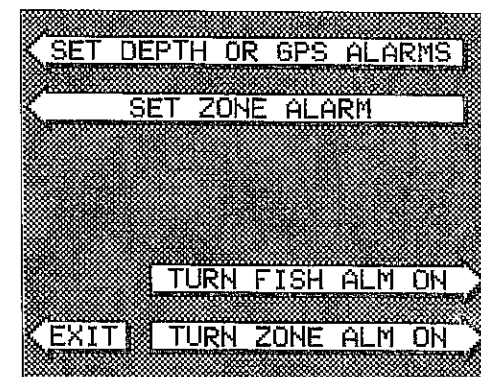
SELECT UNITS OF MEASURE

The UltraNav II can display distance in miles, kilometers, or nautical miles, velocity in miles per hour, kilometers per hour, or knots, bearing in degrees magnetic or true, Altitude in feet or meters, and time in 12 hour or 24 hour format.

SONAR ALARMS

The UltraNav II has three different types of sonar alarms. The first is the Fish Alarm. It sounds when the Fish I.D. feature determines an echo or group of echoes is a fish. Another alarm is the Zone Alarm which consists of a bar. Any echo that appears inside this bar triggers the alarm. The last alarm is called the Depth Alarm. Only the bottom signal will trigger this alarm. This is useful as an anchor watch, a shallow water alert, or for navigation. See the GPS section for information on GPS alarms.

To adjust an alarm, first press the ALARM key. The screen shown below appears. Press the key next to the "SET DEPTH OR GPS ALARMS" to adjust the shallow or deep digital alarms. When you press the key next to the "SET DEPTH OR GPS ALARMS", the menu shown at the top of the next page appears. The zone alarm has its own menu which is shown and described in the zone alarm section. Once you see this screen, press the down arrow key until the black box is on the desired alarm. In this example, the shallow alarm is selected. Now press the key next to the "CHANGE VALUE" label. Use the numbered keys to set the alarm. For example, to set the shallow alarm's value to 10 feet, press the 1 key, then press the 0 key. When the desired value has been entered, press the key next to the "ENTER" label. The unit returns to the ALARMS screen.



When either depth alarm sounds, a "Silence Alarm" label appears at the bottom of the screen. Press the "CLEAR" key to mute the alarm. When the alarm is triggered again, the alarm will also sound.

The following section describes each sonar alarm and its limits.

FISH ALARM

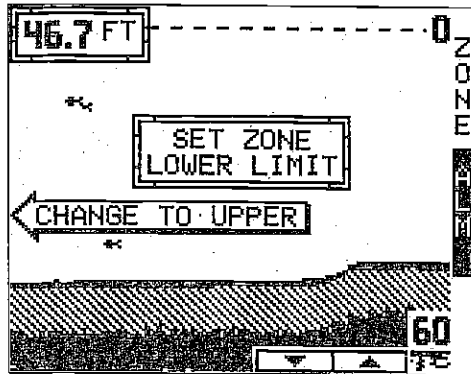
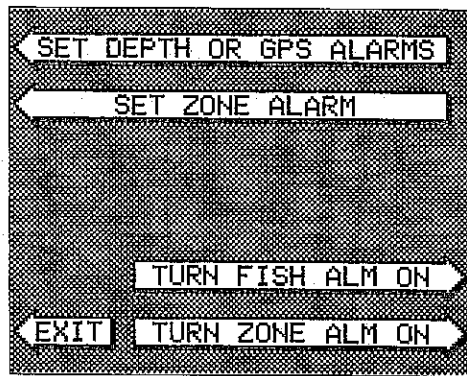
Use the fish alarm for a distinctive audible alarm when fish or other suspended objects are detected by the Fish I.D. feature. A different tone sounds for each fish symbol size shown on the display.

ZONE ALARM

The zone alarm consists of a bar that appears on the right side of the screen. Any echo that appears on the screen between the top and bottom of the zone alarm's bar will "trip" the zone alarm.

Note: The zone alarm isn't available in the Windows mode.

To set the zone alarm, press the ALARM key. Now press the key next to the "Set Zone Alarm" label. A screen similar to the one shown below appears.



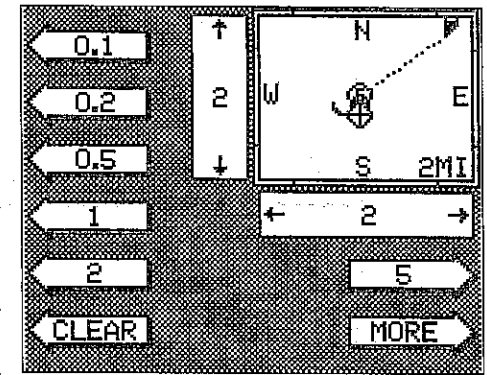
The zone alarm bar shows on the right side of the screen. Use the arrow keys to move the bottom of the bar higher or lower. To move the top of the bar, first press the key next to the "CHANGE TO UPPER" label. Now use the arrow keys to move the top of the bar higher or lower. When you have the zone alarm bar set as desired, press the CLR key to erase the menus.

The above steps automatically turn the zone alarm on if it was off. To turn the zone alarm off, press the ALARM key, then press the key next to the "Turn Zone Alarm Off" label at the bottom of the screen.

Normally, the zone alarm bar disappears from the screen after you make adjustments. To leave the zone alarm bar on the screen all of the time, see the "Display Zone Alarm Bar" section in this manual for instructions.

SET RANGE

Use this menu to change the plotter's range or distance across the plotter's display. The range is 1 statute mile when the UltraNav II is turned on for the first time. The available plotter ranges are .1, .2, .5, 1, 2, 5, 10, 20, 50, and 100 miles. This lets you "zoom in" to see small variations in your course or "zoom out" to see your starting position, present position, track, course, and destination.



ICON ON/OFF

Pressing this key turns on the icons that you placed on the screen using the EVENT MARKER key. For more information on this feature, see the Event Marker section. This also turns on all of the waypoint icons, also.

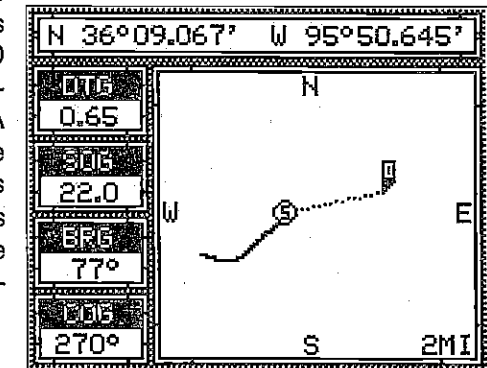
ALARMS

Press this key for the alarms menu. For more information on the alarms, see the ALARMS section.

GOTO CURSOR

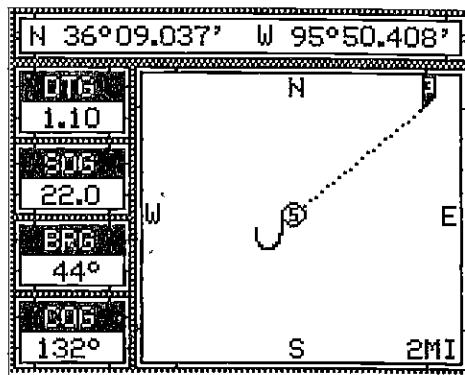
As previously described, the cursor lines can be used to place an icon or highlight a position. When you use the cursor lines, the position of the cross hairs on the display are shown at the top of the screen. Pressing the key next to the "GOTO CURSOR" label on the plotter menu causes the UltraNav II to show navigation and steering data to the position shown by the cross hairs. This automatically turns the arrival alarm on, also.

To use this feature, first move the cursor lines to the desired location on the plotter screen. Next, press the MENU key. Finally, press the key next to the "GOTO CURSOR" label. The unit returns to the plotter screen. A waypoint flag appears on the screen (numbered "0") that was the location of the cursor cross hairs when you pressed the key next to the "GOTO CURSOR" label.



PLOTTING WITH A WAYPOINT

Using the plotter with a recalled waypoint or route is an easy way to see the effects of wind and current on your boat. It also simplifies navigation. To use the plotter in this manner, first recall a waypoint or start a route. (See the Waypoint Recall section for more information.) Then press the PLOTTER key. A screen similar to the one at right appears.



The "S" is your starting location. This was your position when you recalled the waypoint. The flashing circle with a cross is your present position. The "flag" with a number inside is the destination (recalled waypoint). The number inside the flag is the recalled waypoint number. In this example, waypoint number 10 is the destination. The dotted line is the shortest, most direct course from the starting point to the destination. Follow this line to get to the waypoint.

An arrival alarm can be set to sound a tone when you come within a preset distance to the destination. See the section on alarms for more information about the arrival alarm.

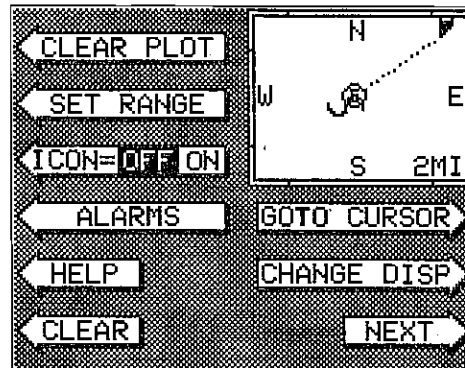
PLOTTER MENUS

Pressing the MENU key while the plotter displays gives you a new set of menus that relate only to the plotter. There are two pages of plotter menus.

PLOTTER MENU - PAGE 1

CLEAR PLOT

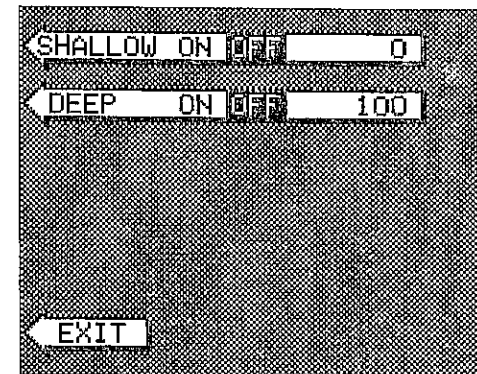
To clear or erase the solid track line from the screen, use the Clear Plot menu selection. The plotter will continue to draw your track after this key is pressed, starting from your present position.



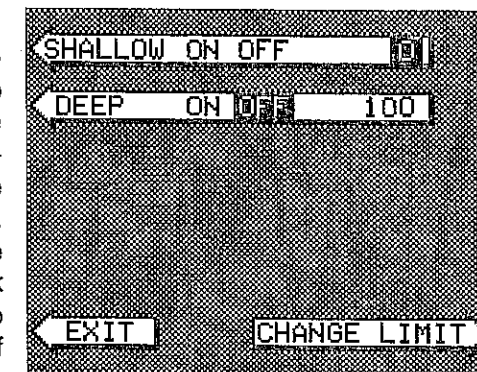
DEPTH ALARMS

The depth alarms sound a tone when the bottom signal goes shallower than the shallow alarm's setting or deeper than the deep alarm's setting. For example, if you set the shallow alarm to ten feet, the alarm will sound a tone if the bottom signal is less than ten feet. It will continue to sound until you mute it or until the bottom goes deeper than 10 feet. The deep alarm works just the opposite. It sounds a warning tone if the bottom depth goes deeper than the alarm's setting. Both depth alarms work only off the digital bottom depth signals. No other targets will trip these alarms. These alarms can be used at the same time or by themselves.

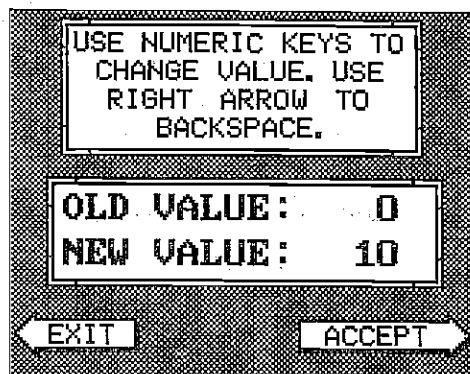
To set the depth alarms, first press the MENU key, then press the key next to the "Adjust Alarms" label. The screen on the previous page appears. Now press the key next to the "Set Depth Alarms" label. The screen at the top of this page appears.



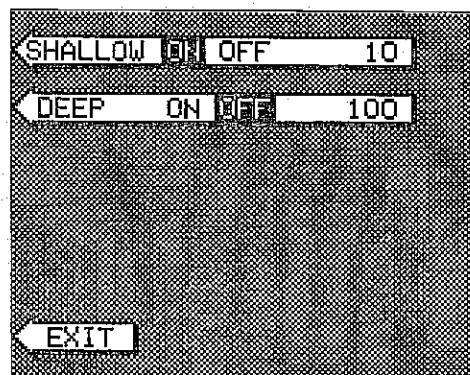
To adjust the shallow alarm, press the key next to the "Shallow" label. To adjust the deep alarm, press the key next to the "Deep" label. Both alarms adjust identically. We'll use the shallow alarm as an example. Pressing the key next to the "Shallow" label moves the black box from the "OFF" position to the number on the right side of the arrow. A new label appears at the bottom of the screen: "CHANGE LIMIT." Press the key next to that label. A new screen appears as shown at the top of the next page. Use the numbered keypad on the right side of the unit to enter the shallow alarm setting. We used 10 feet in this example.



After you've entered the desired alarm depth, press the key next to the "ACCEPT" label. This enters the alarm depth into memory and automatically turns the shallow alarm on. Now press the key next to the "ACCEPT" label.



The screen shown at right appears next. The shallow alarm is now set. If the bottom goes shallower than 10 feet, the alarm will sound and a warning message appears on the screen at the same time. A label also appears letting you mute the alarm, if desired.



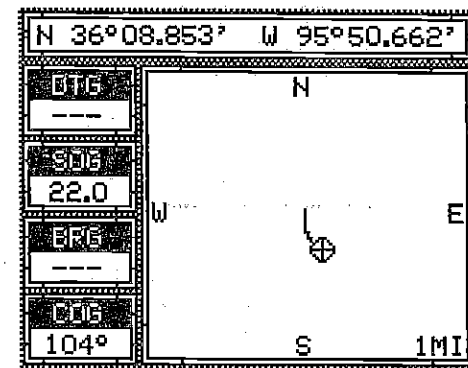
To return to the sonar screen, press the key next to the "EXIT" label.

ALARM MUTE

When either the shallow or deep alarm is triggered, an audio tone sounds. A different tone sounds for the shallow than the deep alarm, thus letting you know which alarm is sounding without looking at the unit. Once a depth alarm is triggered, it keeps sounding until you change depth. For example, if the shallow alarm is set to 10 feet, and you move into and stay in water that's five feet deep, you're going to get tired of listening to the alarm beeping all the time.

To keep this situation from happening, a new label appears on the sonar screen whenever a depth alarm sounds. This label says "Silence Alarm". This turns the alarm's sound off until it's triggered again.

The flashing cross is your present position. The solid line is your track, or path you have just traveled. The large square is a compass rose marked with North, South, East, and West. The square's height and width shows at the bottom of the screen. This is the distance from one side to the other and from the top to the bottom. Your present position is shown at the top of the screen.



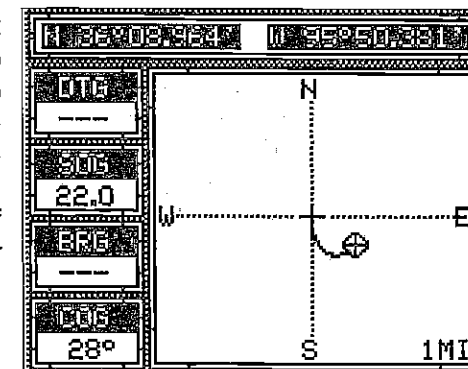
If your present position starts to move outside the square, the UltraNav II clears the display, then re-draws your present position closer to the center of the screen. Your present position will always be displayed on the plotter.

To clear the plotter screen, see the Plotter Menu section.

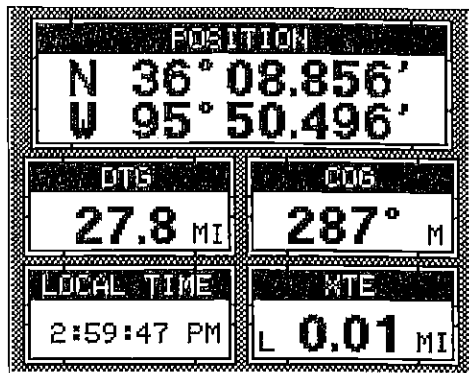
On the left side of the screen are the Distance To Go (DTG), Bearing (BRG), Speed Over Ground (SOG), and Course Over Ground (COG) digital displays. All of these displays are used when a waypoint is recalled, except COG that is always active. These displays also can be customized. See the Plotter Menu section for more detail.

PLOTTER CURSOR

The plotter cursor can help you determine the latitude/longitude of a waypoint or event marker. To use it, press the up or down arrow key while the plotter is displayed. A screen similar to the one below appears. Two new lines appear on the screen. These are the plotter cursor lines. Also, the present position display at the top of the screen switches to show the latitude/longitude position of the plotter cursor - not your present position. Use the arrow keys to move the plotter cursor lines to the desired location. To erase the cursor lines, press the CLEAR key. This also will switch the position display at the top of the screen back to showing your present position.



In this example, we changed the Bearing display to DTG (Distance To Go) by pressing the up arrow key twice.



To change another digital display, press the left or right arrow key. The label in the next digital display box changes as you press the arrow key. Again, press the up or down arrow key to change the display.

The digital displays available for use are:

- BRG Bearing
- SOG Speed Over Ground
- DTG Distance To Go
- DEST WPT Destination Waypoint
- POSITION Present Position
- ALT Altitude
- DEPTH Water Depth
- RTE NAME Route Name
- WPT NAME Waypoint Name
- TTG Time To Go
- XTE Cross Track Error
- LOCAL TIME Time at your location
- COG Course Over Ground

When you have the display arranged as desired, press the CLEAR key. This "locks" the display. Every time you switch to this display, it will appear as you designed it, unless you preset the unit.

PLOTTER

The plotter lets you see your course and direction of travel on the screen. If you've recalled a waypoint, the plotter shows your starting location, present position, and destination. However, you do not have to recall a waypoint to use the plotter.

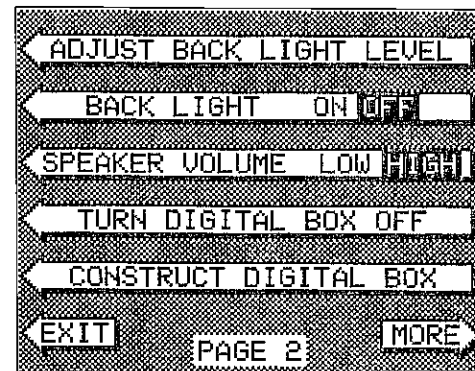
The plotter also can show grid lines on the display. These grid lines show latitude and longitude lines that can help you visualize your position or the location of other objects.

To use the plotter, simply press the PLOTTER key. A screen similar to the one at the top of the next page appears.

MENU - PAGE 2

ADJUST BACK LIGHT LEVEL

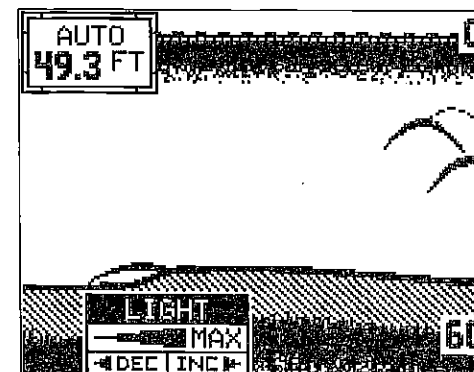
The UltraNav II has internal lights for the display and keyboard. To adjust the intensity of the lighting, press the MENU key twice, then press the key adjacent to the "ADJUST BACK LIGHT LEVEL" label. The screen shown below appears.



Now press the left arrow key to decrease the light level. Press the right arrow key to increase it. The percentage of back light in use changes as the arrow keys are pressed. The bar chart also gives a graphical indication of the level. After you've made the adjustment, press the CLEAR key to erase the menu.

BACK LIGHT ON/OFF

To turn the back lighting on, press the menu key twice, then press the key adjacent to the "BACK LIGHT" label. This moves the black box from "OFF" to the "ON" position. To turn the backlights off, repeat the same steps.



SPEAKER VOLUME

The speaker volume has two levels: high or low. When the UltraNav II is first turned on, the speaker volume is high. To change it, press the MENU key twice, then press the key next to the "SPEAKER VOLUME LOW HIGH" key. This switches the volume from high to low. A short tune sounds, letting you hear the volume. To switch back to high, simply press the key again.

To exit from this menu, press the CLEAR key.

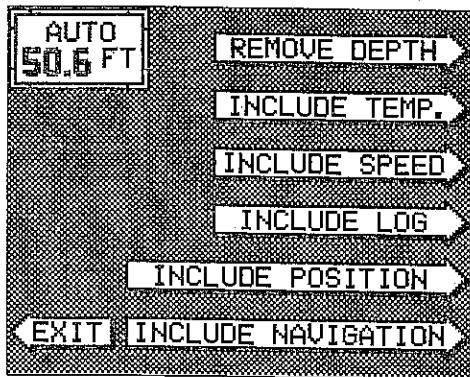
TURN DIGITAL BOX OFF

The digital box is displayed in the upper left corner of the full sonar screen. It has the digital depth and automatic/manual indicators. To turn this box off, press the MENU key twice, then press the key adjacent to the "TURN DIGITAL BOX OFF" label. Repeat the above steps to turn the box on.

CONSTRUCT DIGITAL BOX

The UltraNav II Plus can display the depth, speed, surface water temperature, and distance log in the upper left portion of the screen. When the UltraNav II Plus is first turned on, only the depth is displayed. You can turn each digital display on as desired or turn all of them off, as desired.

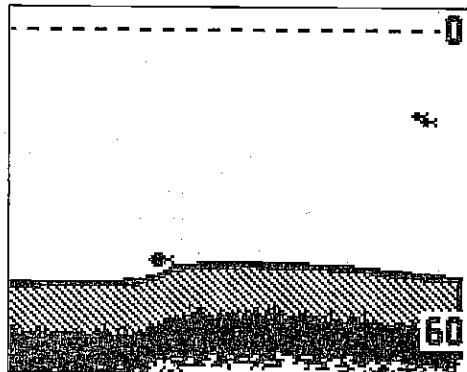
To select the digital displays menu, first press the menu key three times. Next, press the key adjacent to the "CONSTRUCT DIGITAL BOX" menu. A screen appears that is similar to the one below.



Now press the key adjacent to the desired display. For example, to turn the temperature display on, press the key adjacent to the "INCLUDE TEMP." label. Once you do this, the digital display in the corner of the screen will show the temperature in addition to the depth. The temperature menu label now shows "REMOVE TEMP." You can turn each display on or off individually.

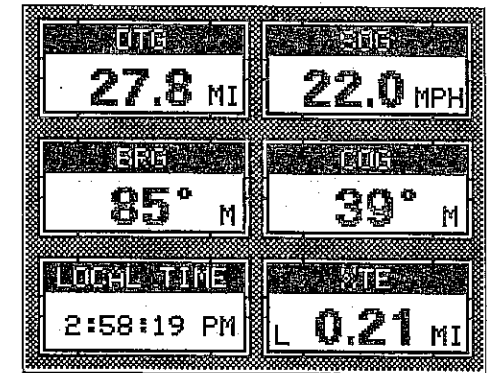
Press the CLEAR key to exit from this menu or wait approximately ten seconds and the menus will automatically clear.

To turn the entire digital box off, press the MENU key twice, then press the key next to the "TURN DIGITAL BOX OFF" label. The unit will return to the sonar display with the digital box erased from the screen. To turn it on again, repeat the above steps. The label on the second menu page now reads "TURN DIGITAL BOX ON."



NAVIGATION SCREEN

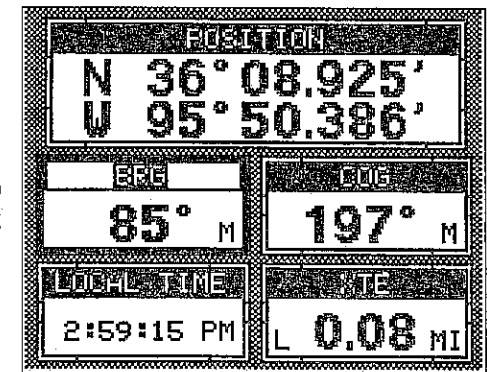
Use the navigation screen when you're navigating to a waypoint. It shows your Distance To Go (DTG), Bearing to Waypoint (BRG), Local Time, Speed Over Ground (SOG), Course Over Ground (COG), and Cross Track Error (XTE). To use the navigation screen, first recall a waypoint, then press the MENU key. Next, press the key next to the "NAV SCREEN" label. A screen similar to the one at right appears.



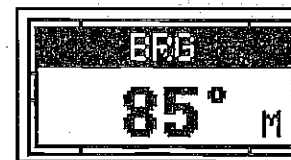
CUSTOMIZE SCREENS

The digital displays on the bottom half of the Position and Steering screens, plus all the displays on the Navigation screen can be changed as desired. To show how this is done, we'll use the Position screen as an example. First, make certain the Position screen is displayed. If it isn't, press the MENU key while the unit is in the GPS mode. Now press the key next to the "POSITION SCREEN" label at the top of the display.

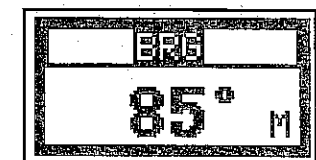
To customize the Position Screen, first press the MENU key. The first GPS menu screen appears. Press the key next to the "CHANGE POSITION DISPLAY" label. The unit returns to the Position Screen with a black box around the Bearing (BRG) label.



The black box identifies the Bearing box as "ready for change." To change the Bearing display, press the up or down arrow keys to select the display that you want to show inside the box.



NORMAL DISPLAY



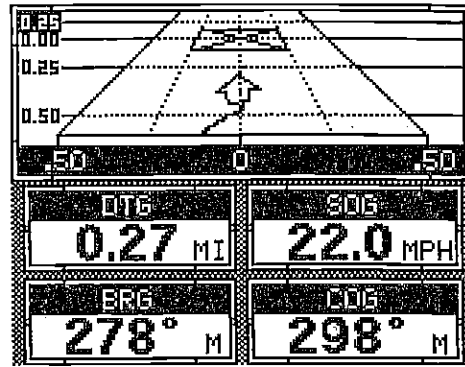
DISPLAY READY FOR CHANGE

At the bottom of the screen are the Local Time and Cross Track Error Displays. Please note that you must recall a waypoint to use the Bearing and Cross Track Error displays.

STEERING SCREEN

The steering screen shows a pictorial view of your boat and course travelled. This is called a Course Deviation Indicator or CDI. It also shows Distance To Go (DTG), Speed Over Ground (SOG), Bearing to Waypoint (BRG), and Course Over Ground (COG).

Your present position is shown by the arrow. The arrow shows the direction the boat is heading relative to the waypoint. In theory, if you steer the boat with the arrow always pointing towards the waypoint, then you will arrive at the waypoint. The solid line extending from the arrow is your track or path you've taken. To travel directly to a waypoint, try to keep the arrow on the center line. The waypoint is depicted by a box at the top of the CDI display. As you approach the waypoint, the arrow and the box will move closer together. If you travel past the waypoint, the waypoint's box will move to the bottom of the display.



The numbers on the top left side of the screen are distance markers, showing the remaining distance to the recalled waypoint. If the numbers have a black box surrounding them, then the distance markers is showing the distance PAST the waypoint. In other words, if the numbers are surrounded by a black box, then you have passed the waypoint and need to turn around.

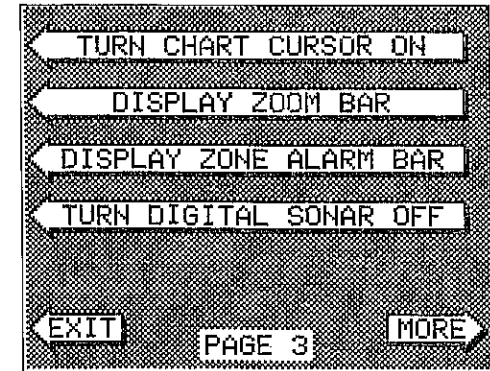
The numbers immediately below the CDI are the CDI range in miles. This gives you an idea of how far off course you are. For example, if the arrow is halfway between the course line and the outside left line and the CDI range is 0.5 miles, then your cross track error is to the left 0.25 miles. The CDI range is the same as the CDI alarm setting. See the section on GPS alarms to change the CDI range.

Using the digital displays at the bottom of the screen with the graphical display at the top let you accurately steer the boat to a waypoint.

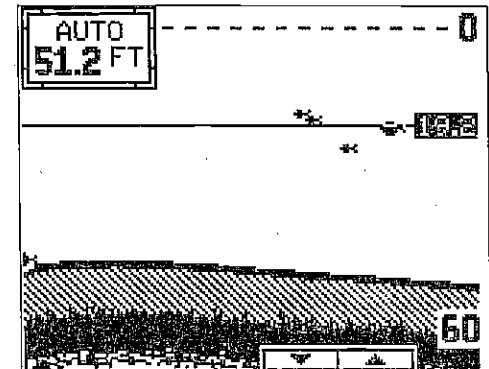
MENU - PAGE 3

CHART CURSOR

The UltraNav II has a chart cursor that allows you to pinpoint a target's depth. The cursor is simply a horizontal line that extends across the display from left to right. A depth box at the end of the line on the right side shows the line's depth. In the example below, the cursor (line) is at 30.0 feet.



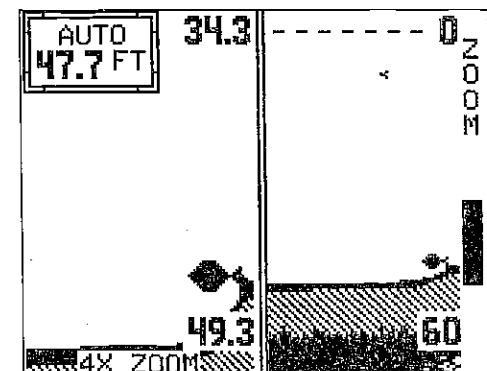
To display the chart cursor, press the menu key three times. Now press the key adjacent to the "TURN CHART CURSOR ON" label. A screen similar to the one at the bottom of this page appears. Use the up or down arrow keys to move the cursor up or down to the desired depth.



To turn the chart cursor off, press the menu key three times. Now press the key adjacent to the "TURN CHART CURSOR OFF" label. The unit returns to the sonar screen.

DISPLAY ZOOM BAR

When the unit is in the zoom mode, the zoom bar doesn't normally show on the screen. The zoom bar shows the section of water on the right side of the screen that the zoom feature displays on the left side. To turn the zoom bar on continuously, first press the MENU key until the 3rd menu page appears. Now press the key next to the "DISPLAY ZOOM BAR" label.



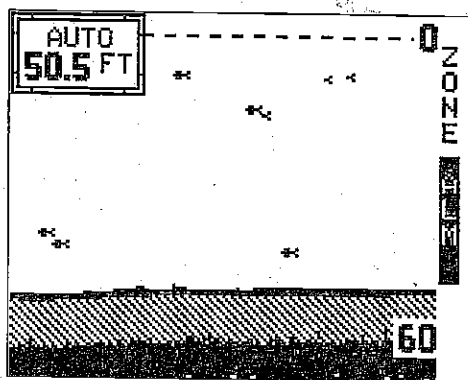
To turn the zoom bar off, press the MENU key until the third

menu page appears, then press the key adjacent to the "REMOVE ZOOM BAR" label.

Note: Turning the zoom bar on also turns the zoom feature on.

DISPLAY ZONE BAR

When the zone alarm is on, the zone bar doesn't normally show on the screen. To turn the zone bar on continuously, first press the MENU key until the 3rd menu page appears. Now press the key next to the "DISPLAY ZONE BAR" label.



To turn the zone bar off, press the MENU key until the third menu page appears, then press the key adjacent to the "REMOVE ZONE BAR" label.

Note: Turning the zone bar on also turns the zone alarm on.

DIGITAL SONAR

When the UltraNav II is turned on for the first time, the digital depth display is located at the top left corner of the screen. This display comes from a separate digital sonar built into the unit. It displays only the bottom depth. If it loses the bottom, the last known depth will flash on the display. When the digital finds the bottom, it will automatically display the valid bottom depth again.

The digital sonar can be turned off, however this also turns all automatic features off also, such as auto sensitivity, auto ranging, and Fish I.D.

To turn the digital sonar off, press the Menu key three times. Now press the key adjacent to the "TURN DIGITAL SONAR OFF" label. To turn it back on again, repeat the same steps.

TURN ALL SONAR OFF

To turn all sonar functions off and turn the UltraNav II into a GPS receiver only, press the MENU key until the "TURN ALL SONAR OFF" label appears. Press the key next to that label. This turns the digital sonar and the chart sonar off. Repeat the above steps to turn the sonar on. The label at the bottom of sonar menu page 3 now reads "TURN ALL SONAR ON." Pressing the key adjacent to that label starts all sonar functions.

the satellite above the horizon from your position. AZM is the azimuth or direction of the satellite from your position. For example, if the azimuth of a satellite is 180 degrees, then it is due south. SNR is the signal-to-noise ratio. This tells you how strong the satellite's signal is. The higher the SNR number, the better.

The satellites that are visible in the sky from your position are shown in the lower right corner of the screen under the "VISIBLE SATS" heading.

In the lower left corner of the screen are the DOPS displays. These show you the "Dilution Of Precision" (DOP) for the horizontal (HDOP), geometric (GDOP), position (PDOP), time (TDOP), and vertical (VDOP). The GDOP is the combination value of HDOP, VDOP, and TDOP. The smaller the GDOP's number is, the better. The GPS receiver selects satellites based on GDOP, therefore it always tries to use satellites that have good DOP values. These depend on the azimuth and elevation of the satellite, and any ground based obstructions.

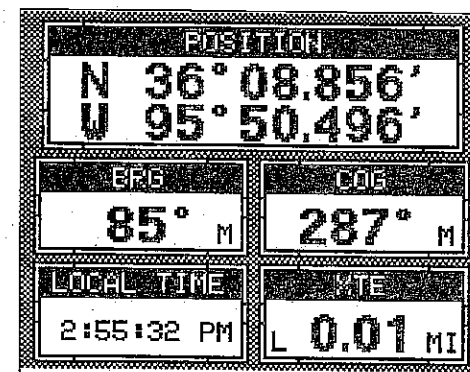
Remember, the smaller the number - the better on all of the DOPs.

POSITION SCREEN

The position screen automatically appears after the UltraNav II is initialized. The position display shows your present position, course over ground (COG), cross track error (XTE), bearing (BRG), and local time.

Your present position displays near the top of the screen in latitude/longitude coordinates. This is shown in minutes, and thousandths of a minute. For example, on this page, the present position is 36 degrees, 8.856 minutes latitude and 95 degrees, 50.496 minutes longitude.

Below the present position on the left side is the Bearing to Waypoint (BRG) display. This is expressed in degrees true or magnetic, depending on the mode the UltraNav II is in. To the right of the Bearing is the Course Over Ground (COG) display.



Below the present position on the left side is the Bearing to Waypoint (BRG) display. This is expressed in degrees true or magnetic, depending on the mode the UltraNav II is in. To the right of the Bearing is the Course Over Ground (COG) display.

it does, your local time and possibly date display will probably be wrong. Use the method shown above to set the time and date to their proper local settings. Once this is done, an internal clock will keep the correct time, even when the unit is turned off. The GPS system updates this clock when the unit is locked on to the satellites.

POSITION/NAVIGATION DISPLAYS

The UltraNav II has a position screen, navigation screen, plotter, steering indicator, and a satellite information screen. These displays were designed to show the most important data. However, you can customize all of them (except the satellite position screen) to some extent through the "Change Display" feature on the first GPS menu screen. (There are other screens that can be customized by using the Windows feature. See the Windows section for more detail.) To customize these screens, see the "Customize" section.

IMPORTANT!

If the data shown in digital numbers on any screen on this unit is flashing, then it means that data is invalid. Do not rely on that data if it is flashing. For example, if the position display is flashing, then the unit has lost the satellites and hasn't re-acquired them. The position that is flashing is your last known position, not your present position! Do not navigate with this unit until you have found the reason the unit has lost the satellites!

Each of the following screens is available by first pressing the MENU key, then pressing the key next to the desired screen label. A detailed description of each screen follows.

SATELLITE INFORMATION SCREEN

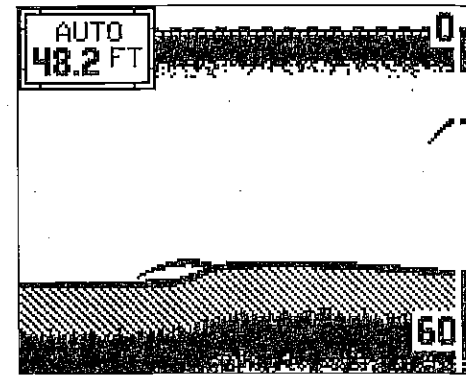
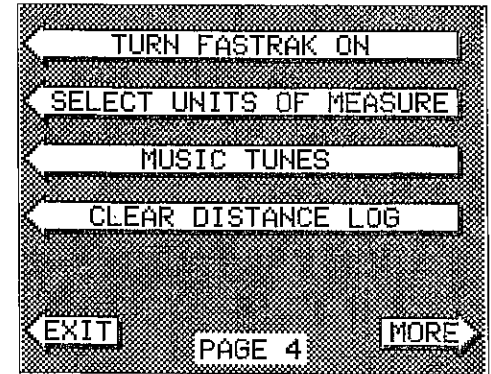
The satellite information screen shows technical data about each satellite in view. The UltraNav II has a five channel GPS receiver. Data on each channel is shown at the top of the display. The channels are numbered one through five on the left side of the screen. Every satellite in the constellation has a number assigned to it, called the PRN. The PRN is the first number in the channel's row. TRK stands for "track." If the UltraNav II is tracking the satellite, then a "T" is placed in this column. If the UltraNav II is searching for the satellite, then a "S" appears. ELV is the elevation (height) of

CHN	PRN	TRK	ELV	AZM	SNR
1	13	T	60°	311°	35
2	12	S	27°	324°	29
3	02	T	46°	115°	43
4	24	T	28°	208°	42
5	14	T	19°	74°	35
DOP			VISIBLE SATS		
HDOP	1.69		13 02 06 24		
GDOP	3.87		12 14		
PDOP	3.33				
TDOP	1.98				
VDOP	2.87				

MENU - PAGE 4

FASTRAK

This feature converts all echoes to short horizontal lines on the display's far right side. The graph continues to operate normally. FASTRAK gives you a rapid update of conditions directly under the boat. This makes it useful for ice fishing, or when you're fishing at anchor. Since the boat isn't mov-



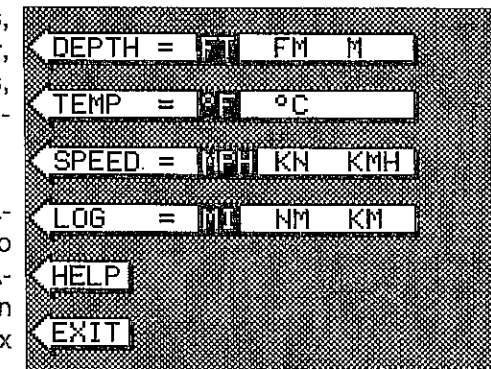
ing, fish signals are long, drawn out lines on a normal chart display. FASTRAK converts the graph to a vertical bar graph that, with practice, makes a useful addition to fishing at a stationary location.

To turn FASTRAK on, press the menu key four times, then press the key adjacent to the "TURN FASTRAK ON" label.

To turn it off, repeat the same steps. The "TURN FASTRAK OFF" label appears instead of the "TURN FASTRAK ON" label.

SELECT UNITS OF MEASURE

The UltraNav II can display the water depth in feet, fathoms, or meters, surface water temperature in degrees Fahrenheit or Celsius, speed in statute miles per hour, kilometers per hour, or knots, and distance (log) in miles, kilometers, or nautical miles.



To change the units of measure, press the key adjacent to the "SELECT UNITS OF MEASURE" label. The screen shown at right appears. The black box

on each line shows the unit of measure currently in use. In the screen shown below, the units of measure are in feet for the depth, temperature in degrees Fahrenheit, and both speed and log are in statute miles per hour.

Press the key adjacent to the unit that you wish to change. For example, press the key next to the DEPTH label two times to switch from feet to meters. This moves the black box two times from the "FT" to the "M". When you have the units of measure set as desired, press the key next to the "EXIT" label.

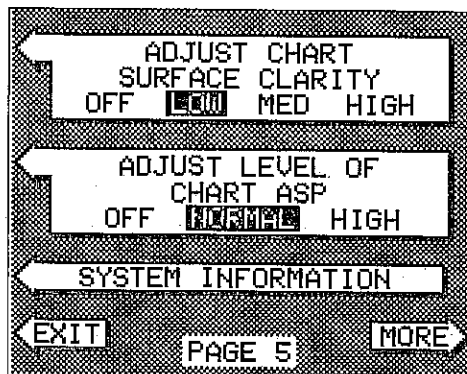
CLEAR DISTANCE LOG

The UltraNav II starts counting distance as soon as it is turned on. To reset the distance log to zero, press the MENU key until the "CLEAR DISTANCE LOG" label appears, then press the key adjacent to that label.

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ADJUST CHART SURFACE CLARITY

The markings extending downward from the zero line on the chart are called "surface clutter." These markings are caused by wave action, boat wakes, temperature inversion, and other natural causes.

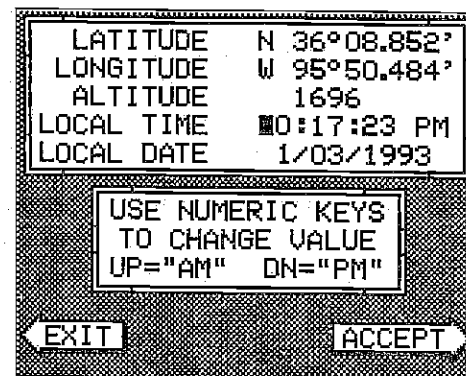


The Surface Clarity Control (SCC) reduces or eliminates surface clutter signals from the display. SCC varies the sensitivity of the receiver, decreasing it near the surface and gradually increasing it as the depth increases. The maximum depth that SCC will affect is 75% of the selected depth range. For example, on a 0-60 foot range with maximum SCC, surface clutter will be reduced down to 45 feet.

There are three levels of SCC available on the UltraNav II: low, medium, and high. When it's turned on for the first time, the SCC level is low. To change it, press the MENU key five times, then press the key adjacent to the "ADJUST CHART SURFACE CLARITY" label until the black box is on the desired SCC level.

Press the key next to the "EXIT" label when you're finished.

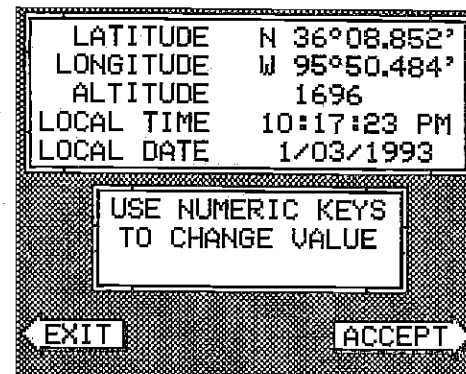
Use the number keys to enter the time. Press the up arrow key to change the time from AM to PM or the down arrow key to change from PM to AM. Press the key next to the "ACCEPT" label when you're finished.



CHANGE DATE

To enter today's date, press the key next to the "CHANGE DATE" label. The screen shown below appears. Enter the date using the numbered keys. When you're finished, press the key "ACCEPT" label.

The numbers at the top of the screen should be correct. If they aren't, press the key next to the label that you need to change. If everything is correct, press the key next to the "EXIT" label. The unit will switch to the position screen and start searching for the satellites currently in view. It should find the satellites and show a position in a few minutes.



COLD START

When the UltraNav II is turned on for the first time "out of the box", it automatically sends a "cold start" message to the GPS receiver. You also can send a cold start message to the receiver.

If the unit can't lock on to the satellites using the data you've given it, or if it has trouble finding the satellites, perhaps it is using the wrong data. This can happen if you've entered the wrong data by accident. For example, given it east longitude instead of west. Or if you've moved a long distance with the unit turned off.

To send a cold start message to the receiver, press the GPS key. Next, press the MENU key. Now press the key next to the "CHANGE GPS SETTINGS" label. Finally, press the key next to the "GPS "COLD" START" label. The unit will begin a cold start technique to find the available satellites. It should lock on to them in 15 minutes or less. Remember, when

CHANGE POSITION

Use a chart to determine your position if you don't know it. The latitude/longitude that you enter doesn't have to be extremely accurate. Typically, if you enter a position within one degree of your present position, the UltraNav II should quickly find your actual latitude/longitude. To change your present position, first press the key next to the "CHANGE LAT" label. The screen shown below appears. Use the down arrow key to change the "N" to "S", if necessary. Next, simply enter your present latitude using the numbered keys. Notice that the position entered is in degrees, minutes, and hundredths of a minute. (Not seconds!) If you make a mistake, press the left or right arrow keys to move to the number in the latitude that needs changing. After the latitude has been entered, press the key next to the "ACCEPT" label.

LATITUDE	N 36°08.852'
LONGITUDE	W 95°50.484'
ALTITUDE	1696
LOCAL TIME	10:17:23 PM
LOCAL DATE	1/03/1993

USE NUMERIC KEYS
TO CHANGE VALUE
UP="N" DN="S"

EXIT ACCEPT

Now press the key next to the "CHANGE LON" label. The black box will be next to the "E" on the longitude. Again, use the up or down arrow keys to switch the "E" to "W" or west longitude, if necessary. Now enter the longitude using the numbered keys. Be certain to enter a zero "0" as the first number in the longitude if it's less than 100 degrees! After you've entered the last number, press the key next to the "ACCEPT" label.

CHANGE ALTITUDE

To enter your present altitude, press the key next to the "CHANGE ALT" label. The UltraNav II needs to know your elevation above sea level. (Not your height above the ground.) Again, an approximation is usually sufficient. Use the numbered keys to enter your altitude data. Press the up arrow key if your altitude is below sea level. For example, suppose you're in Death Valley and the spot you're standing in is 35 feet below sea level. You would need to enter the numbers "35", then press the up arrow key to change it to -35 feet. Press the key next to the "ACCEPT" label when you're done.

CHANGE TIME

To change the local time (the time at your position), press the key next to the "CHANGE TIME" label. The screen shown at the top of the next page appears.

ASP (Advanced Signal Processing)

The ASP feature is a noise rejection system built into the UltraNav II that constantly evaluates the effects of boat speed, water conditions, and interference. This automatic feature gives you the best display possible under most conditions.

The ASP feature is an effective tool in combating noise. In sonar terms, noise is any undesired signal. It is caused by electrical and mechanical sources such as bilge pumps, engine ignition systems and wiring, air bubbles passing over the face of the transducer, even vibration from the engine. In all cases, noise can produce unwanted marks on the display.

The ASP feature has two levels - Normal and High. If you have high noise levels, try using the "High" ASP setting. However, if you are having trouble with noise, we suggest that you take steps to find the interference source and fix it, rather than continually using the unit with the high ASP setting. However, there are times when you may want to turn the ASP feature off. This allows you to view all incoming echoes before they are processed by the ASP feature.

To change the ASP level, press the MENU key five times. Then press the key next to the "ADJUST LEVEL OF CHART ASP" label until the desired level is obtained.

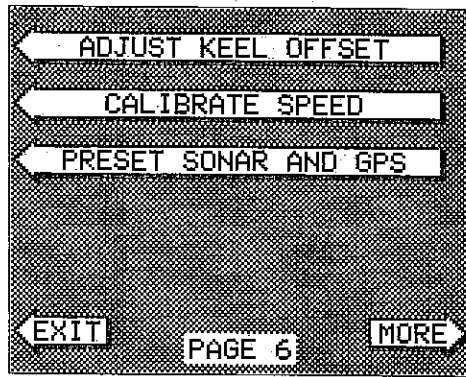
SYSTEM INFORMATION

The System Information menu gives you the date and revision number of the software used in the Accura. To view this menu, press the Menu key, then press the key next to the "More" label until the fifth menu page appears. Now press the key next to the "SYSTEM INFORMATION" label. A screen similar to the one at right appears. To return to the sonar screen, press the key next to the "Exit" label.

SYSTEM INFORMATION	
EAGLE ELECTRONICS	
COPYRIGHT 1992	
CODE VERSION -- U2.5B	
EXIT	

ADJUST KEEL OFFSET

The keel offset feature lets you compensate for the transducer's location. Since this sonar unit measures the water depth from the face of the transducer, there can be a significant difference between the actual water depth and what is displayed on the unit. For example, suppose you mount a bolt-thru-hull transducer on the bottom of the boat. When you launch the boat you find that this location places the transducer three feet below the surface of the water. Therefore, the depth sounder always reads three feet shallower than the actual water depth. (In other words, if the bottom is 50 feet deep, the depth sounder will read 47 feet, if the transducer is mounted three feet below the surface.) The difference between the depth sounder's reading (47 feet) and the actual water depth (50 feet) is called the keel offset. In this example you will use a *positive* keel offset.

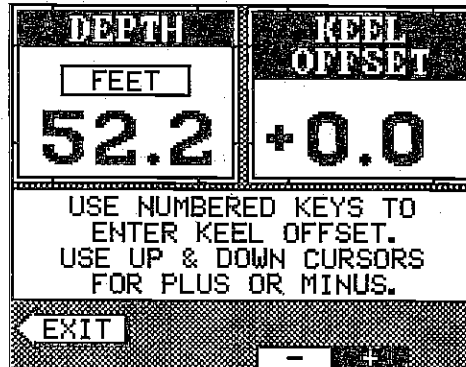


Another time you may wish to change the keel offset is if you want to know the bottom depth from the deepest part of the boat. For example, by careful measurement you find that the deepest part of the boat is four feet below the face of the transducer. By setting a *negative* keel offset of four feet, the sonar unit will show the bottom depth from the lowest part of the boat to the bottom.

IMPORTANT!

The digital depth display is the only sonar that is affected by the keel offset feature. The chart will always show the distance from the face of the transducer.

To adjust the keel offset, first press the MENU key 6 times while a sonar screen is displayed. Now press the key next to the "ADJUST KEEL OFFSET" label. The screen shown below appears.



The digital depth displays in the upper left corner of the screen. The keel offset in use shows in

GETTING STARTED

Initialization - Power On

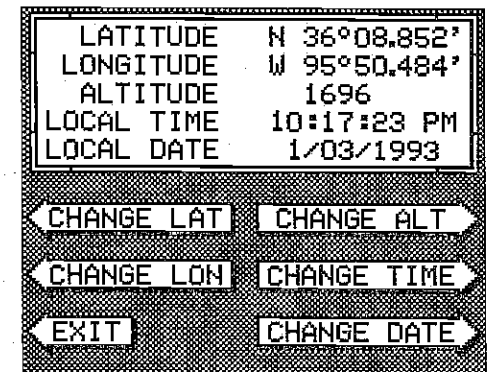
In order for the UltraNav II to lock onto the satellites, it must first find them. If you simply turn the unit on and wait, the unit will find the satellites by itself in 15 minutes or less. This is called "Cold Start." If you let it find the satellites, the time display will probably be wrong, since it will be showing UTC time or the time at Greenwich, England. However, all other navigation displays, including the position display will be correct. (You can set the time to your local time.) To speed up the satellite acquisition process, you can initialize the UltraNav II or "tell it where it is" the first time it's turned on. This initialization process is usually done only once and requires the following data:

1. Present position in latitude/longitude
2. Elevation above sea level (altitude)
3. Today's date and time

The unit usually only takes a few minutes or less to find the satellites once it's been initialized by the user.

After the power cable and GPS antenna module are installed, press the ON key, then press the GPS key. Next, press the MENU key. Now press the key next to the "CHANGE GPS SETTINGS" label. Finally, press the key next to the "SET LAT, LON, ALT, TIME, DATE" label. The screen shown below appears next.

This is the GPS setup screen. The settings now in use are shown at the top of the display. If you're using the unit for the first time, these settings are probably wrong for your position and time. To change any of the numbers on this display, simply press the key next to the arrow with the desired label. For example, to change the local time, press the key next to the "CHANGE TIME" label.



Note: If you don't use the "cold start" feature, then you will have to change all of the settings on this page to their correct values. In other words, you can't simply enter your present position and have the unit find the correct values by itself.

ACCURACY

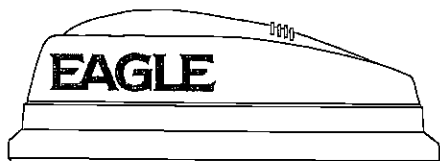
You may have heard tales of extraordinary accuracy from GPS receivers. The DOD requires accuracy of 10 to 15 meters from the satellite system. However, only the military gets this precision. The way the military keeps us and other unauthorized people from using the more precise system is coding. In other words, the data coming from the satellites is encrypted. Civilian GPS receivers use "C/A Code." It's accuracy is intentionally worse than the military's "P Code." In this manner, civilian users worldwide can benefit from excellent position fixes. Meanwhile, the military keeps the most accurate system away from potential enemies. Theoretically, C/A code can give accurate position fixes up to 15 meters. This is more than adequate for most people.

However (as of this writing), the military isn't satisfied with C/A's potential accuracy in the hands of the world. So, it's degrading it further with "Selective Availability" or SA. This is small, random errors intentionally added to the system so your accuracy will typically be within 100 meters. Of course, accuracy also depends on the angle of the satellite above the horizon, signal-to-noise ratio, the number of satellites tracked at one time (the more the better), and other factors. The smallest ranges on the plotter may not be usable if the SA is high. The present position symbol can move off the screen even while you're sitting still.

Don't let this discourage you, however. GPS by nature has much faster updates than other systems (such as Loran), and typically is much easier to use. Accuracy, even with SA on is still better than most other navigation systems. You've purchased one of the finest navigation instruments on the market today. We hope you'll enjoy it for many years to come.

The EAGLE EGP-1 GPS Module

This GPS receiver is currently used in all Eagle GPS receivers. It's small, rugged, and fast. The five channel design lets it track all satellites in view and acquire up to five satellites at one time. It sends position information to the UltraNav II once every second. By incorporating Rockwell's GPS receiver technology with Eagle's state-of-the-art design and manufacturing capabilities, Eagle brings to the consumer the most advanced line of GPS marine navigation systems available in the world.



the upper right corner. To set it, simply enter the desired depth using the numbered keys. Remember to add tenths. For example, to set the keel offset to three feet, first press the 3, then press the 0 keys. Next, press the key next to the ENTER label. Press the key next to the "EXIT" label to return to the sonar screen.

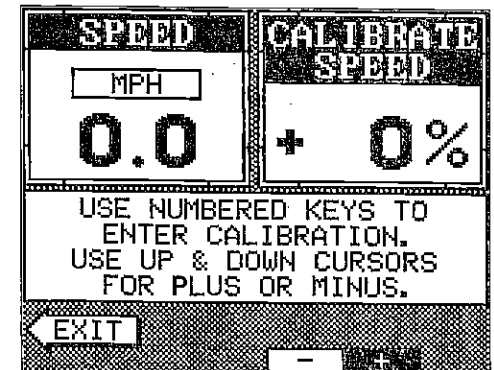
To enter a negative keel offset, use the same steps as above, but press the down arrow key to switch the depth from positive to negative before you press the key next to the "ENTER" label.

To turn the keel offset feature off, enter "0.0".

CALIBRATE SPEED

The speed display on the sonar screens comes from the optional speed sensor - not the GPS receiver. To calibrate this sensor to your boat, first press the MENU key six times while a sonar screen is showing. Now press the key next to the "CALIBRATE SPEED" label. The screen shown below appears.

Your current boat speed is shown in the upper left corner of the screen. The calibration in percent is shown in the upper right corner. Now enter the percent change that is needed to make the UltraNav II's speed display match your actual speed. For example, if the UltraNav II's speed display is five percent slower than your actual speed, then use a positive five percent. If the UltraNav's speed display is five percent faster than your actual speed, then use a negative five percent speed calibration. The up and down arrow keys change the factor from positive to negative.



When you have the speedometer calibrated, press the key next to the "EXIT" label to return to the sonar screen.

PRESET SONAR AND GPS

The UltraNav II has a built-in memory that saves all settings such as sensitivity, chart speed, keel offset, speed calibration, and more. Virtually all settings except for waypoint and route information is saved in this memory. (Waypoints, icons, and routes are saved in a separate memory.)

Therefore, every time you turn the unit on, the settings are exactly as you left them.

However, you can return the UltraNav II to its factory settings using the preset feature. This returns all sonar and GPS receiver settings at the same time. To use this feature, press the MENU key six times while a sonar screen is showing. Next, press the key adjacent to the "PRESET SONAR AND GPS" label. The screen will clear and return to the sonar display.

TRANSDUCER CONE ANGLES

The sound waves from the transducer spread out into the water in a cone shaped beam. This looks much like the beam from a flashlight. The angle between the outside edges of the cone is the cone angle.

Eagle offers a choice of transducers with either an 8 or 20 degree cone angle. The transducer supplied with the UltraNav II has a 20 degree cone angle. Typically, wide cone angle transducers (20 degrees) are ideal for operating in shallow to medium water depths. The 20 degree cone angle allows you to see more of the underwater world. In 15 feet of water the 20 degree cone covers an area about six feet across. The 8 degree transducer covers only about a two foot circle.

The 20 degree transducer is almost always the best to use in fresh water, the 8 degree mostly in salt water. In a deep water environment, (300 feet - fresh water, 100 feet - salt water) the narrow cone angle is more desirable. Since the sound energy is concentrated in a smaller area, it can penetrate to much deeper depths.

Both 8 degree and 20 degree transducers give accurate bottom readings, even though the bottom signal is much wider on the 20 degree model. This is because you are seeing more of the bottom. Remember, the shallow edge of the signal shows you the true depth. The rest of the signal tells you whether you are over rocks, mud, etc.

If the cone passes over a fish in shallow water, the signal displayed on the UltraNav II may not arch at all. This is due to the narrow cone diameter and the resolution limitations of the display.

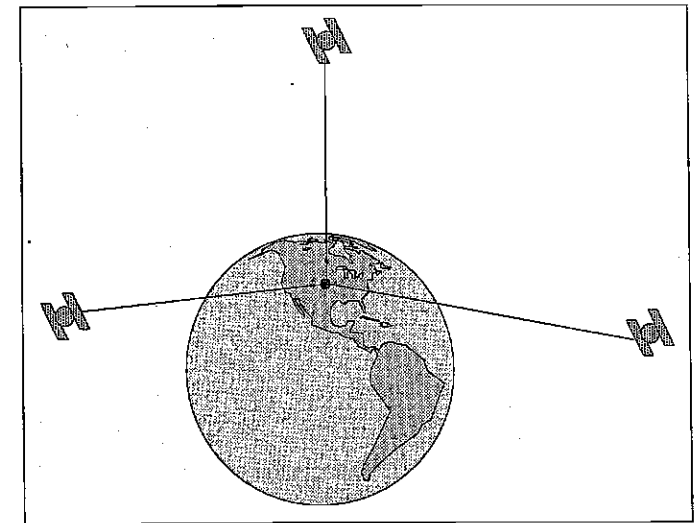
FISH ARCHES

Fish arches are created when the cone of sound passes over a fish. The distance to a fish when the cone first strikes it is shown as "A" on the next page. When the center of the cone strikes the fish, the distance is shorter as shown "B". As the cone leaves the fish, the distance increases again as shown in "C".

GPS - HOW IT WORKS

The Global Positioning System (GPS) is the best approach to navigation that has ever been devised. Conceived by the Department of Defense (DOD) and the United States military, the GPS system is an answer to their needs of 24 hour global positioning, 365 days a year.

Basically, the system works by using a constellation of satellites orbiting Earth 11,000 miles in space. There will be 21 satellites in orbit when the system is fully operational. Three more satellites will act as spares, for a total of 24. When all satellites are in place, at least four of them will be in view nearly anywhere on Earth twenty-four hours a day. The GPS receiver requires at least three satellites to give a "2D" fix. (A 2D fix is your position in latitude/longitude. A 3D fix is your latitude/longitude plus altitude.) When it locks on to at least four satellites, it displays a 3D fix.

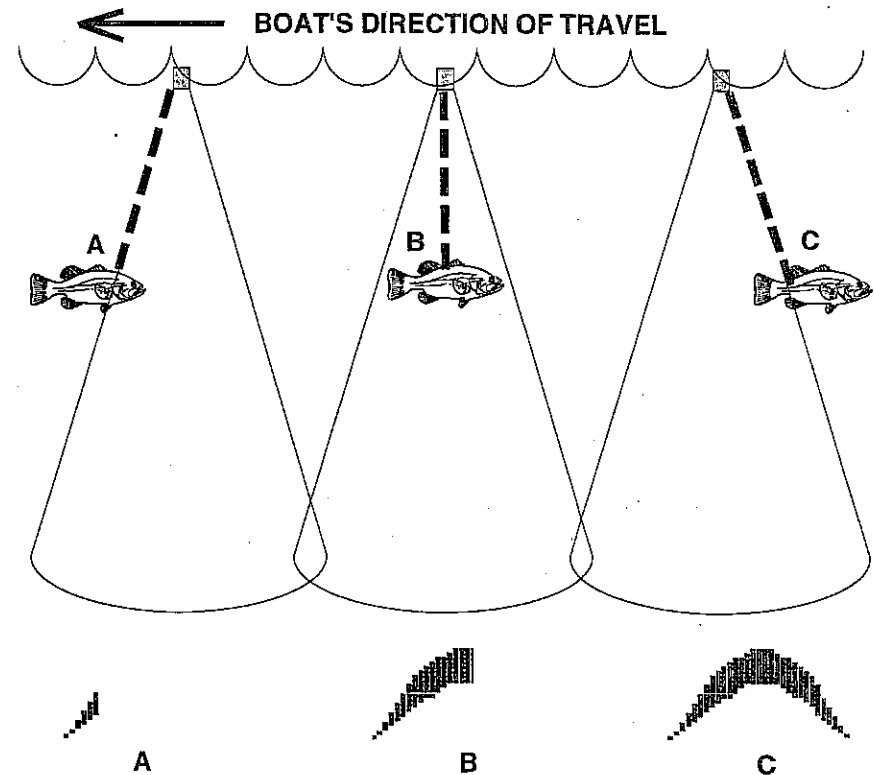
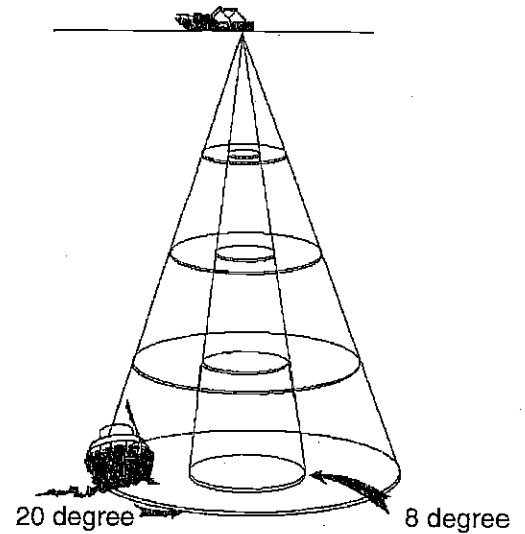


It takes three satellites to determine position.

As the receiver locks on to each satellite, it calculates the distance from the satellite by measuring the length of time it takes the radio signal to reach it. Each satellite has an extremely accurate clock that tells the receiver when the radio transmission started. The receiver compares that time against its own clock, thus it knows how long it took the radio signal (travelling at the speed of light!) to reach it. If you know time and speed, then you can calculate distance. Once you have this from three satellites, then the receiver can determine position.

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Very small fish probably will not arch at all. Medium sized fish will show a partial arch, or a shape similar to an arch if they're in deep water. Large fish will arch, but turn the sensitivity up in deeper water to see the arch. Because of water conditions, such as heavy surface clutter, thermoclines, etc., the sensitivity sometimes cannot be increased enough to get fish arches.

One of the best ways to get fish arches is to expand or "zoom" a segment of the water. For example, from 45 to 60 feet. The smaller the segment, the better the screen resolution will be. The easiest way to do this on the UltraNav II is with the Zoom feature. This feature expands the echoes, making it easier to see detail. For the best results, turn the sensitivity up as high as possible without getting too much noise on the screen. In medium to deep water, this method should work to display fish arches.

If you see fish signals when the unit is in the manual mode, but don't get fish symbols when the Fish I.D. feature is on, try increasing the sensitivity.

WATER TEMPERATURE AND THERMOCLINES

Water temperature has an important-if not controlling-influence upon the activities of all fish. Fish are cold blooded and their bodies are always the temperature of the surrounding water. During the winter, colder water slows down their metabolism. At this time, they need about a fourth as much food as they consume in the summer.

Most fish don't spawn unless the water temperature is within rather narrow limits. A surface temperature meter helps identify the desired surface water spawning temperatures for various species. Trout can't survive in streams that get too warm. Bass and other fish eventually die out when stocked in lakes that remain too cold during the summer. While some fish have a wider temperature tolerance than others, each has a certain range within which it tries to stay. Schooling fish suspended over deep water lie at the level that provides this temperature. We assume they are the most comfortable here.

The temperature of water in the lake is seldom constant from top to bottom. Layers of different temperatures form, and the junction of a warm and cool layer of water is called a thermocline. The depth and thickness of the thermocline can vary with the season or time of day. In deep lakes there may be two or more at different depths. Thermoclines are important to fishermen because they are areas where fish are active. Many times bait fish will be above the thermocline while larger game fish will suspend in or just below it.

ULTRANAV II GPS OPERATION

WARNING!

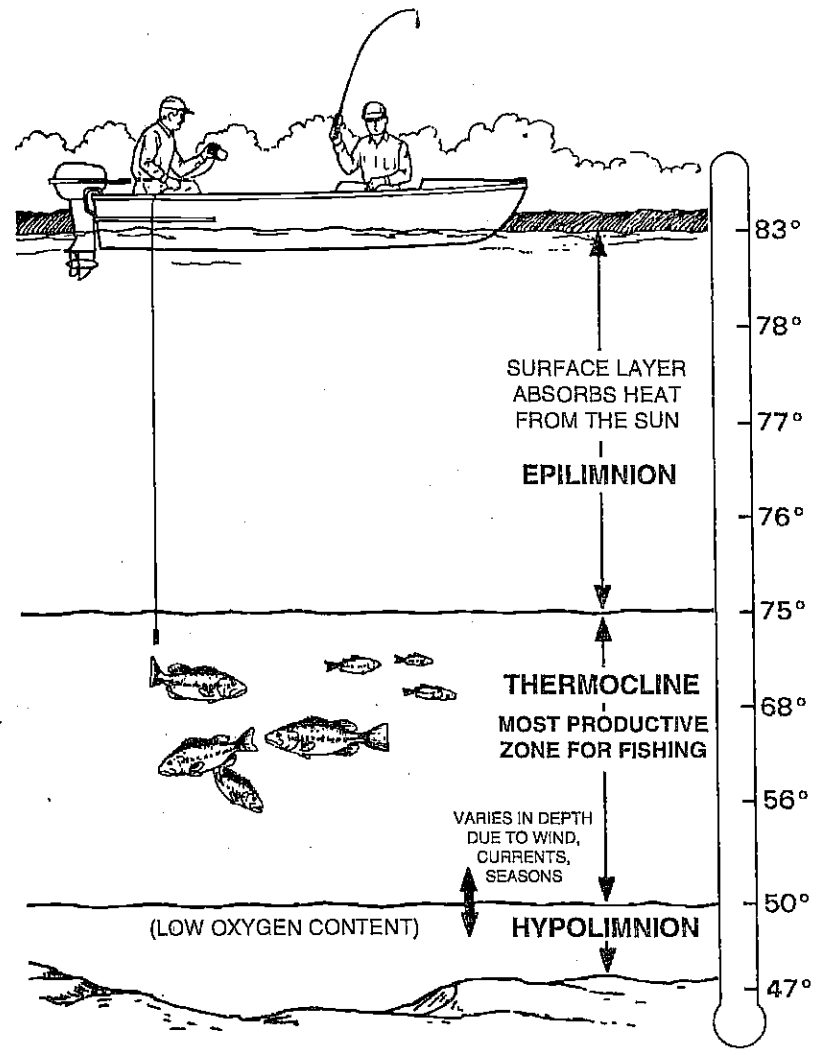
USE THIS GPS RECEIVER ONLY AS AN AID TO NAVIGATION. A CAREFUL NAVIGATOR NEVER RELIES ON ONLY ONE METHOD TO OBTAIN POSITION INFORMATION.

CAUTION

This GPS receiver, (like all GPS navigation equipment) will show the shortest, most direct path to a waypoint. It provides navigation data to the waypoint regardless of obstructions. Therefore, the prudent navigator will not only take advantage of all available navigation tools when travelling to a waypoint, but will also visually check to make certain a clear, safe path to the waypoint is always available.

NOTICE!

As of this writing, the Department of Defense (DOD) has not declared the GPS navigation system operational. The system is still in a testing phase. Satellites can be turned off or accuracy can be degraded at will by the system operators. Remember that the UltraNav II, or any GPS receiver is only as accurate as the system it's using.



The UltraNav II can detect this invisible layer in the water, but the sensitivity will probably have to be turned up to see it.

IMPORTANT TROUBLESHOOTING INFORMATION!

If your unit is not working, or if you need technical help, please use the following troubleshooting section before contacting the factory customer service department. It may save you the trouble of returning your unit.

Unit won't turn on:

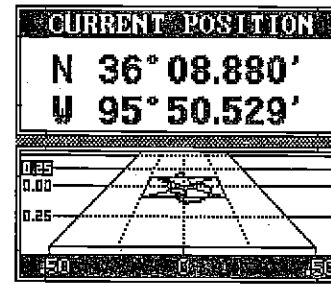
1. Check the power cable's connection at the unit. Also check the wiring.
2. Make certain the power cable is wired properly. The red wire connects to the positive battery terminal, black to negative or ground.
3. Check the fuse.
4. Measure the battery voltage at the unit's power connector. It should be at least 11 volts. If it isn't, the wiring to the unit is defective, the battery terminals or wiring on the terminals are corroded, or the battery needs charging.

Unit freezes, locks up, or operates erratically:

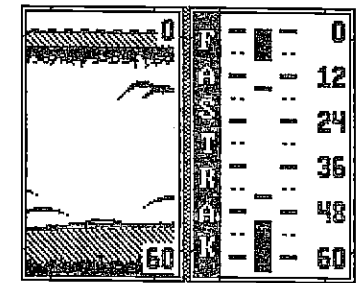
1. Electrical noise from the boat's motor, trolling motor, or an accessory may be interfering with the sonar unit. Re-routing the power and transducer cables away from other electrical wiring on the boat may help. Route the sonar unit's power cable directly to the battery instead of through a fuse block or ignition switch.
2. Inspect the transducer cable for breaks, cuts, or pinched wires.
3. Check both the transducer and power connectors. Make certain both are securely plugged in to the unit.

Weak bottom echo, digital readings erratic, or no fish signals:

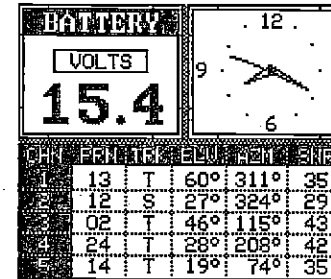
1. Make certain transducer is pointing straight down. Clean the face of the transducer. Oil, dirt, and fuel can cause a film to form on the transducer, reducing its effectiveness. If the transducer is mounted inside the hull, be sure it is shooting through only one layer of fiberglass and that it is securely bonded to the hull. Do NOT use RTV silicone rubber adhesive or Marinetex.
2. Electrical noise from the boat's motor can interfere with the sonar. This causes the sonar to automatically increase its Discrimination or noise rejection feature. This can cause the unit to eliminate weaker signals such as fish or even structure from the display.



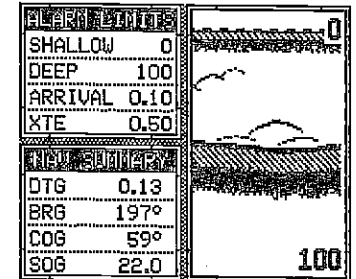
GROUP "P"



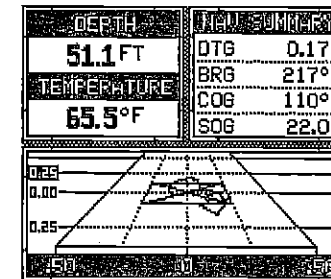
GROUP "Q"



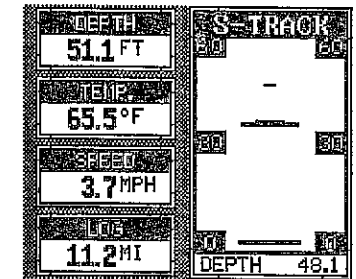
GROUP "R"



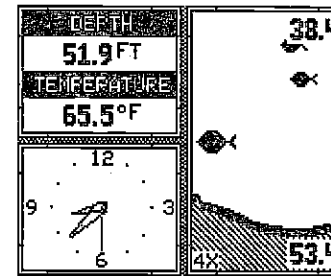
GROUP "S"



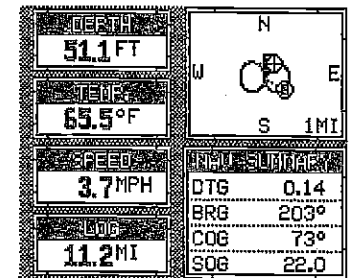
GROUP "T"



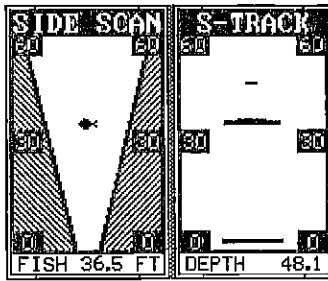
GROUP "U"



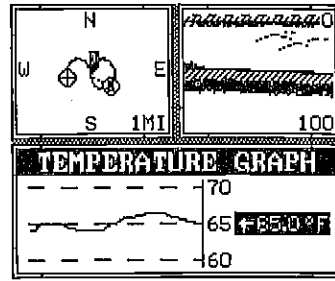
GROUP "V"



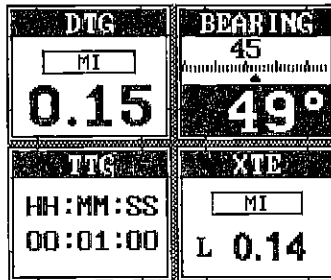
GROUP "W"



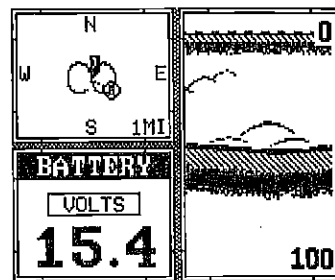
GROUP "H"



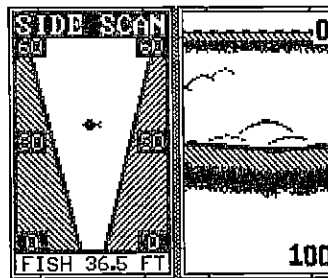
GROUP "I"



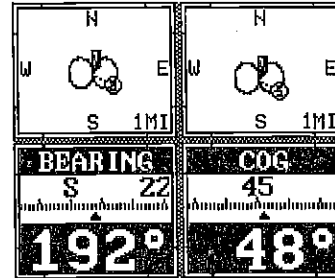
GROUP "J"



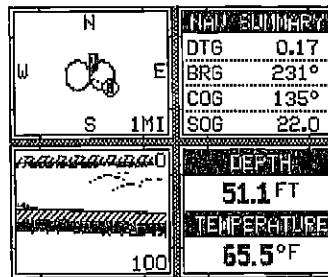
GROUP "K"



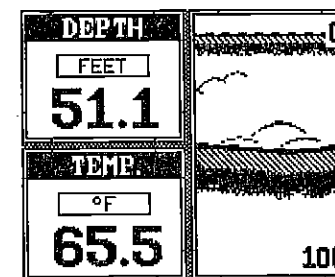
GROUP "L"



GROUP "M"



GROUP "N"



GROUP "O"

3. The water may be deeper than the sonar's ability to find the bottom. If the sonar can't find the bottom signal while it's in the automatic mode, the digital will flash continuously. It may change the range to limits far greater than the water you are in. If this happens, place the unit in the manual mode, then change the range to a realistic one, (for example, 0-100 feet) and increase the sensitivity. As you move into shallower water, a bottom signal should appear.

4. Check the battery voltage. If the voltage drops, the unit's transmitter power also drops, reducing its ability to find the bottom or targets.

Bottom echo disappears at high speeds or erratic digital reading or weak bottom echo while boat is moving

1. The transducer may be in turbulent water. It must be mounted in a smooth flow of water in order for the sonar to work at all boat speeds. Air bubbles in the water disrupt the sonar signals, interfering with its ability to find the bottom or other targets. The technical term for this is Cavitation.

2. Electrical noise from the boat's motor can interfere with the sonar. This causes the sonar to automatically increase its Discrimination or noise rejection feature. This can cause the unit to eliminate weaker signals such as fish or even structure from the display. Try using resistor spark plugs or routing the sonar unit's power and transducer cables away from other electrical wiring on the boat.

No fish arches when the Fish ID feature is off:

1. Make certain transducer is pointing straight down. This is the most common problem if a partial arch is displayed. See the Fish Arch section in this manual for more information.

2. The sensitivity may not be high enough. In order for the unit to display a fish arch, it has to be able to receive the fish's echo from the time it enters the cone until it leaves. If the sensitivity is not high enough, the unit displays the fish only when it is in the center of the cone.

3. Use the Zoom feature. It is much easier to display fish arches when zoomed in on a small range of water than a large one. For example, you will have much better luck seeing fish arches with a 30 to 60 foot range than a 0 to 60 foot range. This enlarges the targets, allowing the display to show much more detail.

4. The boat must be moving at a slow trolling speed to see fish arches. If the boat is motionless, fish stay in the cone, showing on the display as straight horizontal lines.

NOISE

A major cause of sonar problems is electrical noise. This usually appears on the sonar's display as random patterns of dots or lines. In severe cases, it can completely cover the screen with black dots, or cause the unit operate erratically, or not at all.

To eliminate or minimize the effects of electrical noise, first try to determine the cause. With the boat at rest in the water, the first thing you should do is turn all electrical equipment on the boat off. Make certain the engine is off, also. Turn your UltraNav II on, then turn off ASP (Advanced Signal Processing). There should be a steady bottom signal on the display. Now turn on each piece of electrical equipment on the boat and view the effect on the sonar's display. For example, turn on the bilge pump and view the sonar display for noise. If no noise is present, turn the pump off, then turn on the VHF radio and transmit. Keep doing this until all electrical equipment has been turned on, their effect on the sonar display noted, then turned off.

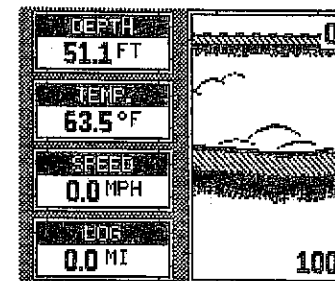
If you find noise interference from an electrical instrument, trolling motor, pump, or radio, try to isolate the problem. You can usually re-route the sonar unit's power cable and transducer cable away from the wiring that is causing the interference. VHF radio antenna cables radiate noise when transmitting, so be certain to keep the sonar's wires away from it. You may need to route the sonar unit's power cable directly to the battery to isolate it from other wiring on the boat.

If no noise displays on the sonar unit from electrical equipment, then make certain everything except the sonar unit is turned off, then start the engine. Increase the RPM with the gearshift in neutral. If noise appears on the display, the problem could be one of three things; spark plugs, alternator, or tachometer wiring. Try using resistor spark plugs, alternator filters, or routing the sonar unit's power cable away from engine wiring. Again, routing the power cable directly to the battery helps eliminate noise problems. Make certain to use the in-line fuse supplied with the unit when wiring the power cable to the battery.

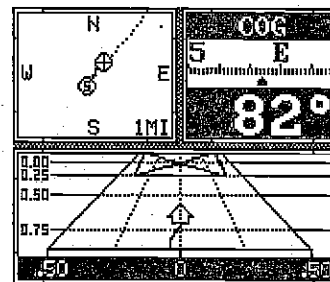
When no noise appears on the sonar unit after all of the above tests, then the noise source is probably cavitation. Many novices or persons with limited experience make hasty sonar installations which function perfectly in shallow water, or when the boat is at rest. In nearly all cases, the cause of the malfunction will be the location and/or angle of the transducer. The face of the transducer must be placed in a location that has a smooth flow of water at all boat speeds. Read your transducer owner's manual for the best mounting position.

WINDOWS SUMMARY

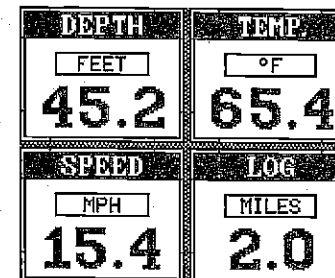
All of the window groups used by the UltraNav II are shown on the following pages. To view these groups, simply press the WINDOWS key, then repeated press the down arrow key. This will "cycle" the unit through all groups.



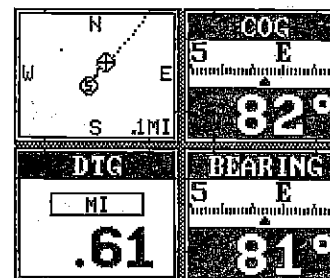
GROUP "A"



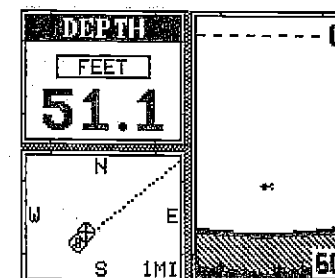
GROUP "B"



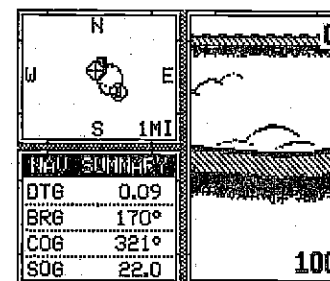
GROUP "C"



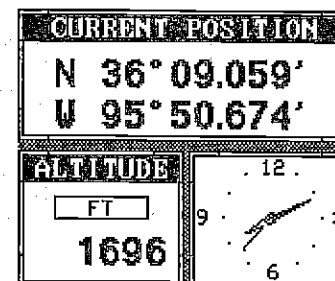
GROUP "D"



GROUP "E"



GROUP "F"



GROUP "G"